FLIGHT

MAGAZINE

MARCH 1957

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With its order for 26 H-21 helicopters West Germany became the fourth NATO nation to acknowledge the ability of Vertol's Work Horse to do the heavy lifting and hauling that cannot be accomplished by any other vehicle.

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MORTON, PENNSYLVANIA

One in a series about users of Phillips 66 Aviation Products

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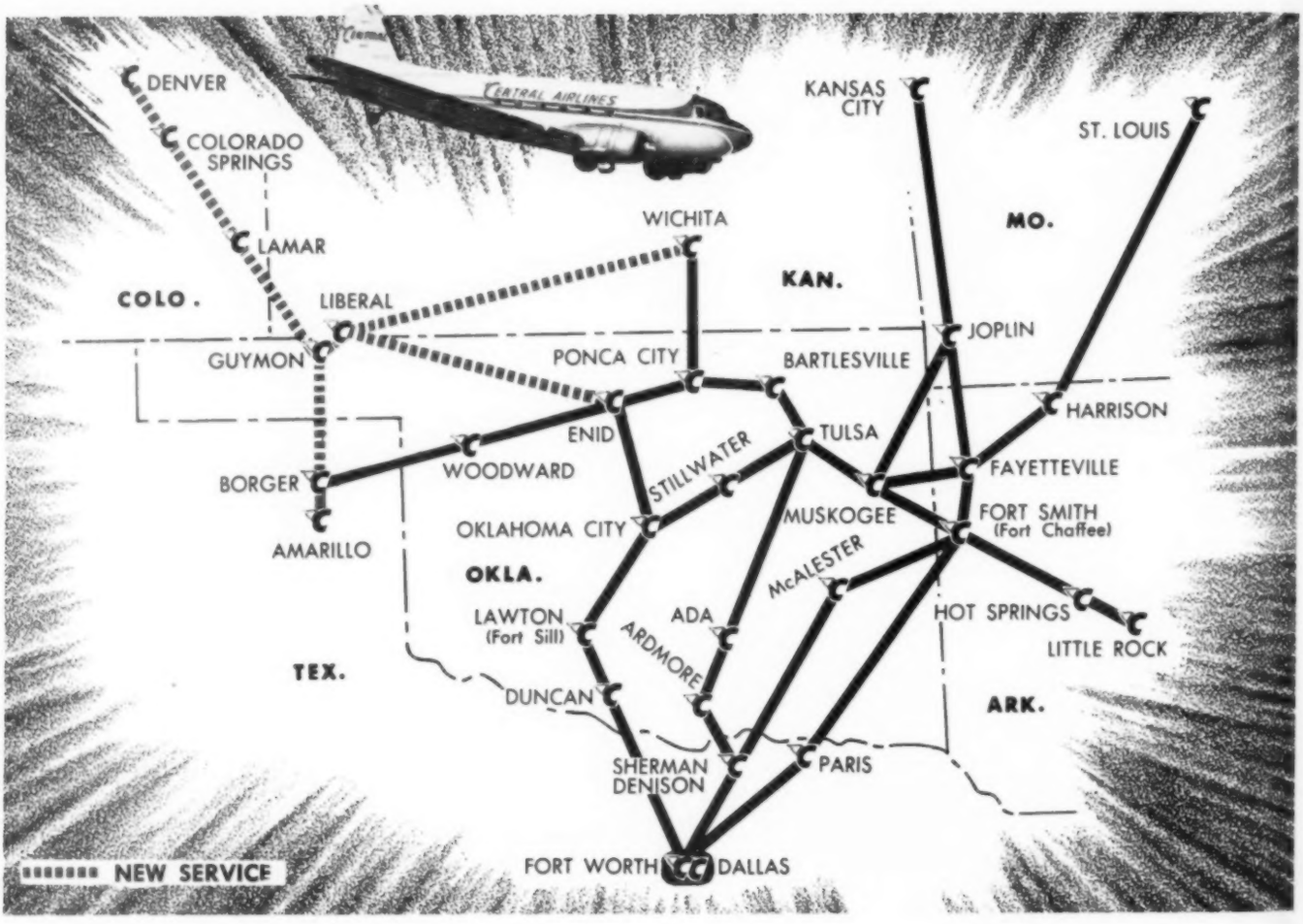
New service for Mid-America . . . Central Airlines recently added routes to Denver, Colorado Springs and other points in keeping with its policy of more and better service to the area. An important connecting line, Central serves 34 cities, 18 of them exclusively. Safety, speed, reliability and comfort are the watchwords that have made Central Airlines synonymous with improved commercial aviation in the Southwest and Great Plains.



● Today, Phillips 66 Aviation Gasoline gives dependable, efficient performance to Central and other leading air lines, as well as to the military air services.

In step with the future, Phillips is a leading producer of *super performance* Jet Fuels for the latest designs in turbo-props and jets. And Phillips research continues to lead the way for development of fuels for the aircraft of tomorrow.

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AIR Report
Significant Trends and News

ENGINE IMPROVEMENTS AT NO COST TO OWNERS of Super 680 Aero Commanders will be made in a cooperative program by Aero Design and its distributors, Lycoming and Bendix. For Lycoming supercharged GSO-480 engines, the improvements include protective piston coating, Nichrome exhaust valve heads, new carburetor vinyl-coated diaphragms, new throttle shaft and bushings, new type automatic mixture control and new fuel-flow rate adjustments. These have been made on current production models but factory teams will visit distributors to make the improvements on 680's already delivered at no cost to owners for parts or labor, according to R. J. White, vice president-sales. Carburetors needing improvements will be removed and sent to nearest Bendix distributor or authorized overhaul station for modernization.

CESSNA 4-ENGINE MODEL 620 Businessliner has completed 170 hrs. of flight tests with numerous test hops under actual all-weather instrument conditions including 30 ILS approaches. Its AiResearch auxiliary turbine power unit for air conditioning, heating and generating has logged 250 hrs. of service tests. Stall tests have been completed with reports of excellent straight-ahead stalls requiring no pilot effort to avoid yaw or roll tendency before pitch at 78 knots TIAS in landing configuration. It not only meets power-on stall recovery requirements with one outboard engine out but is capable of meeting them with two engines out on the same side with normal power on the other two. With 3 engines at METO power and one outboard engine out, rudder trim power is available to hold headings down to 118 knots with feet flat on the floor. Landings have been accomplished with ease in crosswinds of 20 knots.

FRED E. WEICK, father of the Ercoupe, former NACA aerodynamics leader and head of the Aircraft Research Center at Texas A. & M. College, will be director of Piper Aircraft's new development center at Vero Beach, Florida.

BEECH FACTORY SERVICE TEAMS begin touring over 30 distributor centers this month, starting March 18 at Currey Sanders Aircraft in Shreveport, for the ninth year of free factory inspections for Beech owners in the field.

KAMAN AIRCRAFT HAS A NAVY CONTRACT for a new utility helicopter, the single-rotor HU2K-1 powered by the GE T-58 gas turbine.

NEW AERO COMMANDER FOR PRESIDENT OF VIET-NAM is shown being presented to Nguyen qui Anh of the Viet-Nam embassy in Washington by W. W. Brinckerhoff, president of Air Carrier Service Corp. The Commander was later flown across the Atlantic, Europe and the Middle East to Saigon after being delayed in Paris for months by the Egyptian crisis. This was 8th Commander bought by Air Carrier Service and ferried to distant parts of the world.

FLIGHT MAGAZINE

MARCH, 1957 VOL. 46, No. 3

THIS MONTH'S COVER features a marine portrait of the famous Super 200 Royal Gull amphibian, assembled in Milwaukee by Trecker Aircraft Corp. and marketed at $89,925 completely equipped. Powered by two 340-hp. supercharged Lycoming engines, it tops 208 mph., has 11,800-ft. single-engine ceiling, has 1,930-lb. useful load at 6,600-lb. gross weight and seats 5 persons. It will get off the water at gross weight without wind within 14 secs.

—(Trecker Aircraft Photo.)

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIALS: NO MAGIC FORMULA; VALUE UNKNOWN 13

The New Wide-Wing 560E Aero Commander—BY TOM ASHLEY "E" STANDS FOR EXTENDED PERFORMANCE INCLUDING BIG LOADS, LONG RANGE 20

From Bush to Big-Time—BY SANDY A. F. MACDONALD—RUSS BAKER'S METEORIC SUCCESS IN NORTHWESTERN CANADA . . 22

ROTC Flight Training Trends—COLLEGE FLIGHT PROGRAMS FACE PROBLEMS IN GATHERING MOMENTUM 24

Two-Place Comeback—CHAMPION TRI-TRAVELER SPARKS REVIVAL IN DEMAND FOR TWO-PLACE TANDEM LIGHTPLANES . 26

Horsepower at Altitude—BY BOB MACGREGOR—BASIC ENGINE OPERATIONS FOR PILOTS WHO WANT EFFICIENT POWER MANAGEMENT 27

New Business in the Hangar—NATIONWIDE ROUNDUP OF DEVELOPMENTS AT LEADING MODIFICATION AND SERVICE CENTERS 36

Airmen's Calendar—COMING EVENTS 45

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, *Consultant;* P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas—Telephone TAylor 3-6191.

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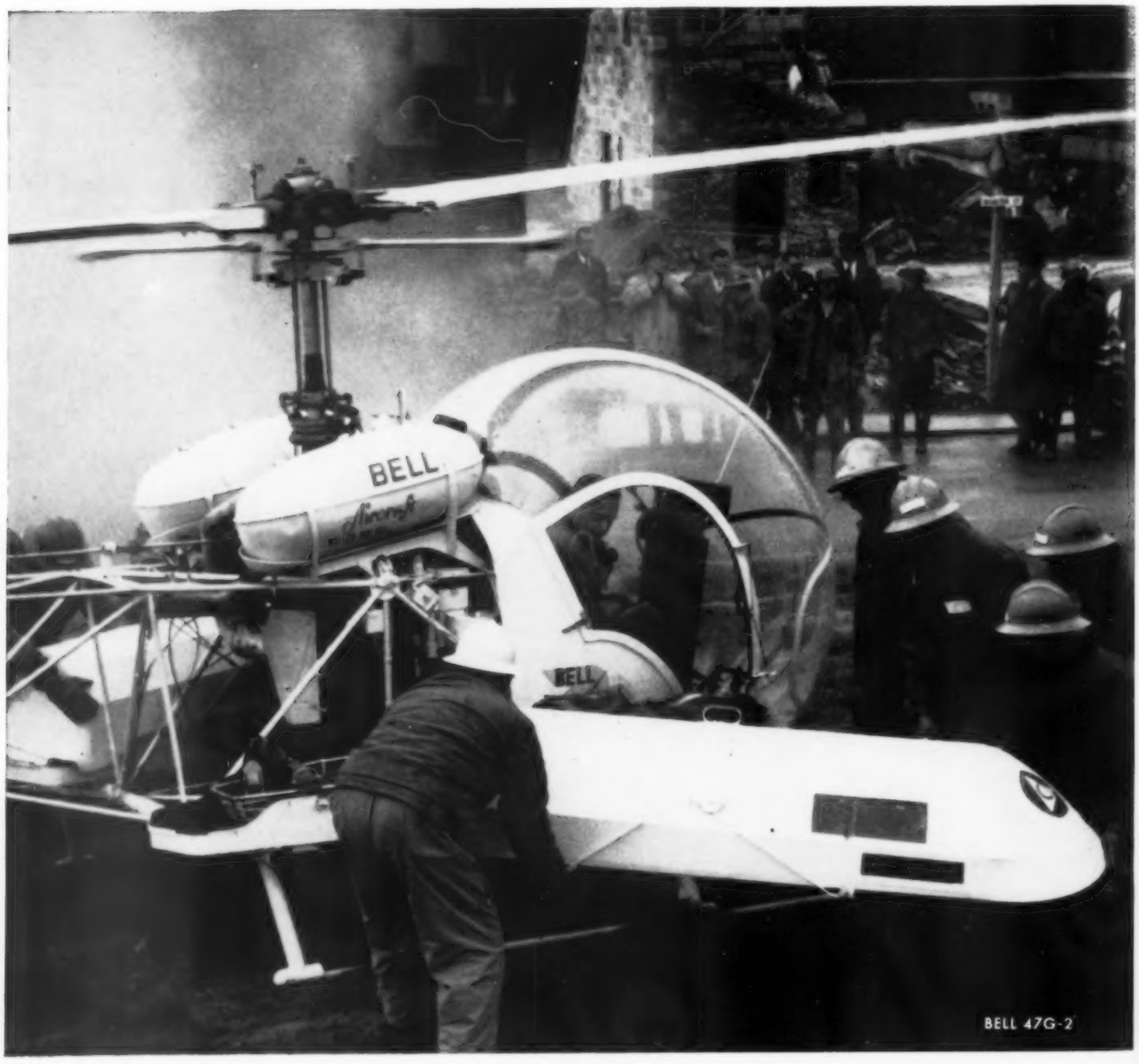
"A new RIGHT HAND for Civil Defense"

... Says the FEDERAL CIVIL DEFENSE ADMINISTRATOR



CONVINCED that the helicopter is ideally suited to meet the problems facing civil defense in a super-weapons era, the FCDA is ready to pay half the cost of civil defense helicopters purchased by states, cities or counties, through the Federal matching grants-in-aid program.

The Bell helicopter, lowest in initial cost and maintenance, is backed by more than two million hours flight experience. As a civil defense vehicle this versatile craft is without competition for evacuation, observation, communications and for transporting food and medical supplies.

Val Peterson, Federal Civil Defense Administrator says: "I want to report my agency ready and eager to help the states and their political subdivisions to buy helicopters for civil defense needs."

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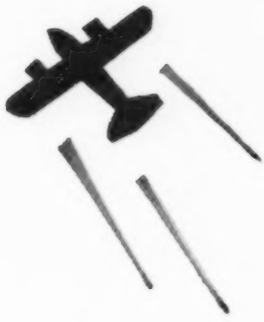

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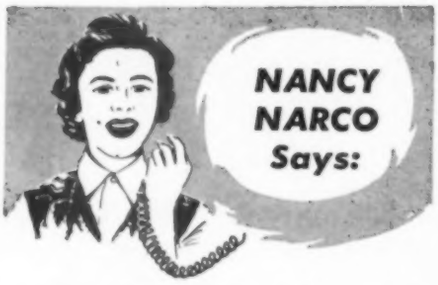

HAD A STARTLING NOTE from a guy out in Nebraska the other day. Said he had this mess of communicating frequencies all worked out—had it figured so he could do all his talking en route, approach, tower and everything on the four-channel transmitter in his Narco Superhomer (the old VHT-2, that is).

EN ROUTE he would call for weather or file his flight plan on 121.5 mc, the emergency channel—tell the man he was unable to establish communications on any other frequency.

TOWERS he would call on 121.9 mc. ground control—no matter where he was. Said all the towers had this channel, so why fuss with any others? And for real important messages, like telling his girl he'd be late for their date, he used 122.8 mc. unicom.

EVEN WHEN they tried to fox him by putting some fields on the alternate ground control frequency, 121.7 mc, he was ready for them with his one remaining unused channel, and would I please have Narco send him a 121.7 mc crystal?

HE WENT on to say he thought he ought to get this crystal for free, in appreciation of his contribution to the simplification of things in general. I didn't read the rest of it. Answered his letter tho, and let him down as gently as possible. Besides breaking about every rule in the book, he was just not being fair to the rest of us in the air. Things are confused enough with everyone obeying the rules.

IF YOU'RE DOING any flying in congested areas you know all about the channel problem. Folks here at Narco tell me over 8,500 of you are using our Homer and Superhomer series radios with four-channel transmitters. You can do the job, but you might feel a little cramped for channels if you work Los Angeles, San Francisco, Midway, LaGuardia or others which don't guard 122.5 mc any more. They guard 122.7 and ground control is 121.7.

SO LET'S SEE—4 channels give you 122.1 En Route, 122.5 and 122.7 Tower, and *either* Unicom (122.8) or Emergency (121.5) or one Ground Control (121.9 or 121.7), not both. You'll get by, but it's so tight that the Narco engineers have managed to put a bunch more channels in the latest Superhomer; there are 12 of them in the new Model VHT-3.

OF COURSE, the de luxe way to communicate is Simplex—talk and listen on the same frequency. When the chart says the tower is on 118.7 mc, set your receiver *and* your transmitter to this frequency and fire away.

Sincerely,

Nancy

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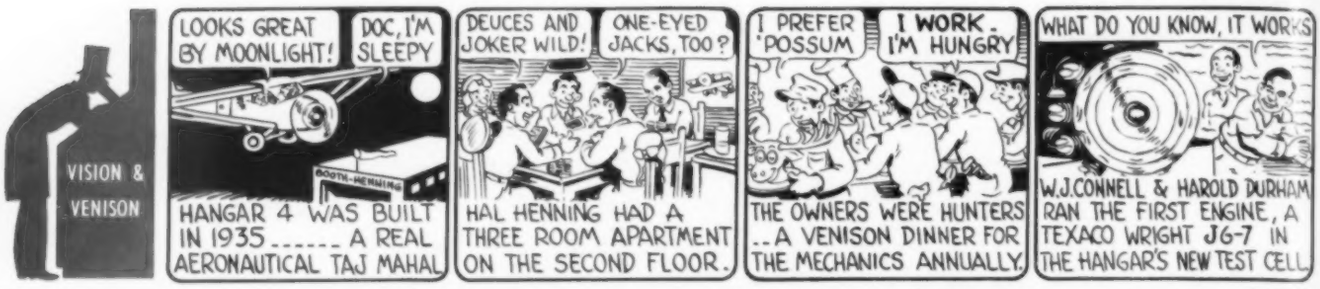
SAC Silver Jubilee Newsreel

BY JACK PATTON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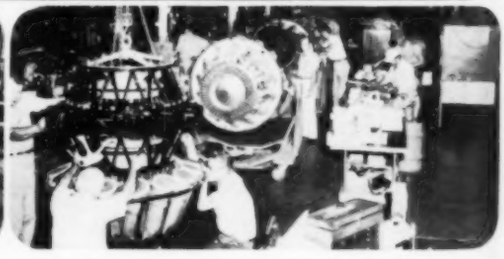

1932 —A QUARTER CENTURY OF LEADERSHIP— 1957

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No Magic Formula

NOW that the time draws near for President Eisenhower's special assistant for aviation facilities planning to hand in his report all the experts, self-appointed and otherwise, are filling the air with a veritable babble of voices, second-guessing and pre-supposing what Mr. Edward P. Curtis and his staff will recommend.

Let's listen for a moment to what Mr. Curtis says. Here are some quotes from an important speech he made last month:

". . . we must proceed at once to modernize our present traffic control system. The present system has real basic limitations so that everyone agrees that if we are to have a system sufficiently flexible to take care of our future needs, we must work as rapidly as possible toward a much more sophisticated approach using the best modern technology available. We must, for example, make full use of computers and display techniques to get away from the present slow and cumbersome method of manual flight strip postings. We must, at least, augment our present overburdened voice communications with some form of rapid, simplified data link method to pass essential information back and forth between the controller and the plane in the air, and between controllers themselves.

". . . our Systems Engineering Team has been working on a master plan for such a traffic control system. The plan will be organized in stages to permit an orderly transition from what we have today. It will start with recommendations for the general application of techniques which are known, but either not yet in use or used only in a limited manner. The second stage will extend to improve procedures which can be used with existing technology and finally, we expect to outline the areas where further research, development and testing will be necessary on a continuing basis.

". . . the plan, insofar as possible, will attempt to provide for the needs of the various types of users from the minimum equipped private flier to the airlines and the military. It will specify the areas in which we believe positive separation will be necessary, such as high altitudes and congested terminals as distinct from areas and altitudes where a minimum control or none at all will be required.

". . . there seems to be a tendency in some quarters of the aviation world to feel that my group will come up with some magic formula which will solve our problems overnight. You know as well as I do that 'there ain't no such animal'. There is an equivalent to the magic formula and that is a systems development organization backed by the best talent in government and industry and set up to work continuously on these ever changing problems."

These straight-forward words need no long-winded explanation or elaboration. There is every reason to believe that the Curtis report to the President will start the pendulum swinging in the other direction toward providing adequate facilities.

Let's not lose sight of the fact that the primary consideration in all the proposals to be made is safety. Every segment of aviation will give a little and take a little in the final cutting of the pie — but everybody will get, we hope, his fair share. As Mr. Curtis so effectively pointed out, there just won't be any miracles — no magic formula. The Congress and the budget people will hold long and tedious hearings, new laws will be written, appropriations will have to be made. Meanwhile we think the important point is for everyone to realize and appreciate that at long last we can hope for immediate improvement all along the line together with some long-range facilities planning, subject to constant revision as our airplanes improve and utilization increases.

It also might be well to point out that everyone will have his day in court. It's the American way. And those who want to put the cost of the improved systems and better airports on users of the facilities will have their day, too. When that hour comes in the law-making, it would be wise to put an end to the intra-industry friction, name-calling and squabbling. The cost is going to be high. A tax burdened public doesn't yell too loudly about a $5 billion highway program because everybody uses automobiles. It doesn't take clairvoyance to foresee the hue and cry we'll hear when the estimates for aviation facilities during the next twenty years hit the Congressional committees and the headlines! It's a multi-billion dollar deal and we had better get squared away now on how we're going to face it.

Value Unknown

WHEN you study a conversion-type airplane like the 300-mph. Howard Super Ventura now being sold to corporations for executive transportation you can't fail to be deeply impressed by the faith and the ingenuity of that hardy band of U. S. aviation entrepreneurs who are taking the American businessman off the highways and putting him into the air with fast, comfortable and dependable transport-type airplanes.

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While we may be on the threshold of large multi-engine pressurized, jet or turbo-prop craft that someday may replace the DC-3's, Lodestars, Howard Super Venturas and the modified military craft of World War II, the fact remains that the conversion geniuses have today's equipment today. Their enterprise and engineering ability have laid the groundwork for the new designs to come. There's no measuring stick with which to gauge the tremendous contributions these specialists are making to the airplane's acceptance by the nation's most successful businessmen in industry.

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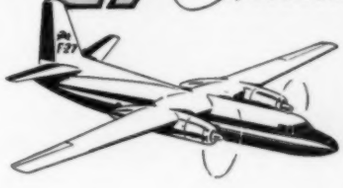

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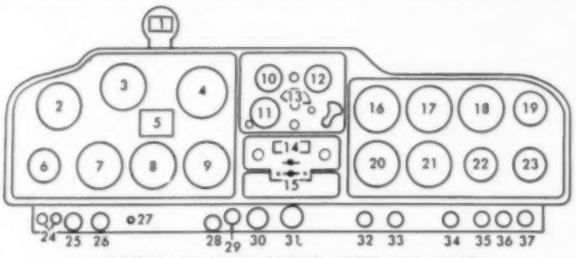

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33. Mixture
34. Cigarette lighter
35. Front heater
36. Rear heater
37. Cool air vent—one of 5 ventilators

Plus these great features—150 hp Lycoming engine; large baggage compartment with separate door; Duraclad finish; simplified inter-connected controls; Hydrasorb tricycle landing gear; flaps; individually adjustable front seats; door locks; metal propeller; muffler and abundant soundproofing; choice of 3 colors—Daytona White with Pasadena Rose, Cadillac Red or Key West Blue.

You're looking at the standard, factory-equipped instrument panel of the Piper Super Custom Tri-Pacer—most popular of three standard models of this easiest-to-fly of all 4-passenger business airplanes.

Study that panel—it's just one of many reasons why you'll find the Tri-Pacer is designed and built to go places.

The Tri-Pacer's panel scientifically places all flight instruments on the left, immediately in front of the pilot. In the center, dual radio providing triple navigational aid – Omni, LF range and homing loop – plus VHF and LF receivers, 12-channel VHF transmitter. On the right, engine and fuel gauges with room for additional instruments.

You may not fly instruments, but you can't deny that full equipment makes VFR flying easier, all flying safer. And you'll agree that the all-around features of the Tri-Pacer make it a thoroughly fine cross-country airplane. Over 130 mph cruising speed at 7,000', range over 550 miles, with a solid "feel" in rough air.

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Aero Commander span is extended 29 inches at each tip on the Model 560E. The result is all-round better performance. Standard fuel capacity is 223 gals. for 1,625-mile range with 30-min. reserve. Useful load is 2,200 lbs. at new 6,500-lb. gross weight. Engines are 295-hp. GO-480-C1B6 Lycomings.
—(Aero Design Photo by Wayne Entriken.)

The New Wide-Wing 560E Aero Commander

Bigger load, longer range distinguish newest Commander model

By TOM ASHLEY

A NEW wide-wing Aero Commander — Model 560E — has been announced by Aero Design & Engineering Co. and represents an accomplishment of more airplane for less money.

It is replacing the Model 560A on the production line, with volume production scheduled to be reached by June. The E version will be priced at $74,900 with high-compression GO-480-C1B6 Lycoming engines, each with sea-level ratings of 295 hp. at 3,400 rpm. for take-off and 280 hp. at 3,000 rpm. for normal operation, with an alternate normal rating of 285 hp. at 3,100 rpm. These engines have been used on the 560A at a price for that model of $76,500, which was $2,000 more than the $74,500 price for the standard Model 560A with GO-480-D1A engines rated at 275 hp. for take-off at 3,400 rpm. and 260 hp. at 3,000 rpm.

But the new 560E, at a lower price than the HC version of the 560A, is a better and more utilitarian airplane in numerous ways — it has, for example, the longest range of any standard twin on the market, its major improvement being greater load carrying ability.

At a new 6,500-lb. gross weight, as compared to 6,000 lbs. for the 560A, the 560E has a 2,200-lb. useful load as compared to only 1,802 for the 560A. This new weight allowance made it possible for the factory to feature 223-gal. usable fuel capacity as standard equipment. Its fuel and oil systems are identical to those of the more powerful Model 680 Super Aero Commander, as are its landing gear, with 3-spot single-disc Goodyear brakes and 8-ply rating tires; its firewall shut-off valves for oil and hydraulic systems and its primers. The engines are dry-sump type, with separate oil supply.

Significance of the larger fuel supply is shown by the new model's cruising range of 1,625 miles with a 30-min. fuel reserve, this being specified for 55% horsepower at 10,000 ft., which provides an economical cruising speed of 182 mph. The previous Model 560A had 156-gal. fuel supply for a range of only 1,080 miles using 55% hp. at 10,000 ft. and allowing for a 30-min. fuel reserve. The improvement, then, is better than 50% in cruising range, making it truly capable of coast-to-coast one-stop business flying with fuel reserves.

High speed of the 560E is 222 mph. at sea level and cruising speed on 70% hp. at 10,000 ft. is given as 210 mph. The economy cruising speed on 55% hp. at 10,000 ft. is 182 mph.

Stall speeds, with power off, are 66 mph. with gear extended and full flaps and 74 mph. clean. These are at 6,500-lb. gross. At the 560A's gross of 6,000 lbs., the 560E's stall speeds are 6 mph. lower.

Minimum single-engine control speed for the 560E is 80 mph., which is unchanged from previous models.

Rate of climb is 1,450 fpm. and single-engine rate of climb is 300 fpm. Service ceiling is 22,500 ft. and single-engine ceiling is 8,000 ft.

Take-off distance over a 50-ft. obstacle is 1,452 ft., and landing distance over a 50-ft. obstacle is 1,500 ft.

The progression from "A" to "E" versions of the 560 does not mean, as customary, that Aero Design advanced

through B, C and D models — the "E" stands for "extended." This is translated literally from extended performance, extended payload and extended range. It also was derived from extension of the wing span to 49 ft., 29 inches having been added to each wing tip outboard of the ailerons.

"Increase in performance in all respects has been attained through a refinement of the design by increasing the aspect ratio of the wing from 8.06 to 9.47," says Ted R. Smith, Aero Design vice president-engineering research and development. "Increase in wing area of 12 sq. ft. was obtained with the increased span and aspect ratio. The new MAC (mean aerodynamic chord) is 70.05 against 72.12 on previous models. At the new 6,500-lb. gross weight, the power loading at take-off is 11.01 lbs. per hp. with a wing loading of 25.5 lbs. per sq. ft.

"This more efficient aircraft has been obtained primarily with the increased span, giving a higher aspect-ratio wing resulting in increased performance parameters throughout the entire speed range and a very slight decrease in wing loading.

"Stall characteristics are further improved over previous models by careful selection of the airfoil for the wing-tip extension as well as careful consideration of the geometric twist of the wing-tip extension.

"Stalls are straight forward without the least tendency for the aircraft to roll at or prior to the stall — no aileron action is necessary to obtain clear-cut straight-ahead stalls — in power-on or power-off conditions. Previous models of the Aero Commander have all shown outstanding stall characteristics; however, the E model is even superior in this respect.

(Continued on page 48)

Aero Commander 560E and 560A Compared

Factory Data

	Model 560E	Model 560A
Price	$74,900	$74,500
No. Seats	5-7	5-7
TO Hp.-rpm.	590-3,400	550-3,400
Rated Hp.-rpm.	560-3,000	520-3,000
Gr. Wt., lbs.	6,500	6,000
Empty Wt., lbs.	4,300	4,198
Useful Ld., lbs.	2,200	1,802
High Spd., mph.-ft.	222-SL	206-10,000
Cr. Spd., mph. %-hp.-ft.	210-70-10,000 182-55-10,000	200-70-10,000
St. Spd., landing, with flaps, mph	66	67
St. Spd., clean, mph.	74	73
Min. SE Control Spd., mph.	80	80
Rate of Climb, fpm.	1,450	1,400
SE Rate of Climb, fpm.	300	250
Svc. Clng., ft.	22,500	21,900
SE Clng., ft.	8,000	7,500
Std. Fuel Cap., gals.	223	156
Ec. Cr. Range, 55% hp., 10,000 ft., (30-min. res.), mi.	1,625	1,050
TO Dist. to 50 ft. ft.	1,452	1,210
Lndng. Dist. from 50 ft., ft.	1,500	1,370
Span, ft.	49	44
Length, ft.-ins.	35-.5	35-.5
Height, ft.-ins.	14-.9	14-.9
Wing Area, sq. ft.	254	242
Wing Loading, lbs. sq. ft.	25.5	24.7
Pow. Ldng., lbs. hp.	11.01	10.9
Cabin Dims., L-W-H, ins.	127.5-52-53	127.5-52-53
Cabin Door, ins.	43-26	43-26
Bag. Door, ins.	23.5-19.5	23.5-19.5
Bag. Vol., cu. ft.	32	32
Bag. Cap., lbs.	350	350

NOTES: All performance is for gross weight at sea level unless noted. Speeds guaranteed within 3%. Climbs and altitudes guaranteed within 8%. Model 560E powered by two 6-cylinder, geared Lycoming GO-480-C1B6 engines; Model 560A powered by two 6-cylinder, geared Lycoming GO-480-D1A engines. Both models equipped with constant-speed, full-feathering Hartzell propellers. Factory data dated Feb. 21, 1957.

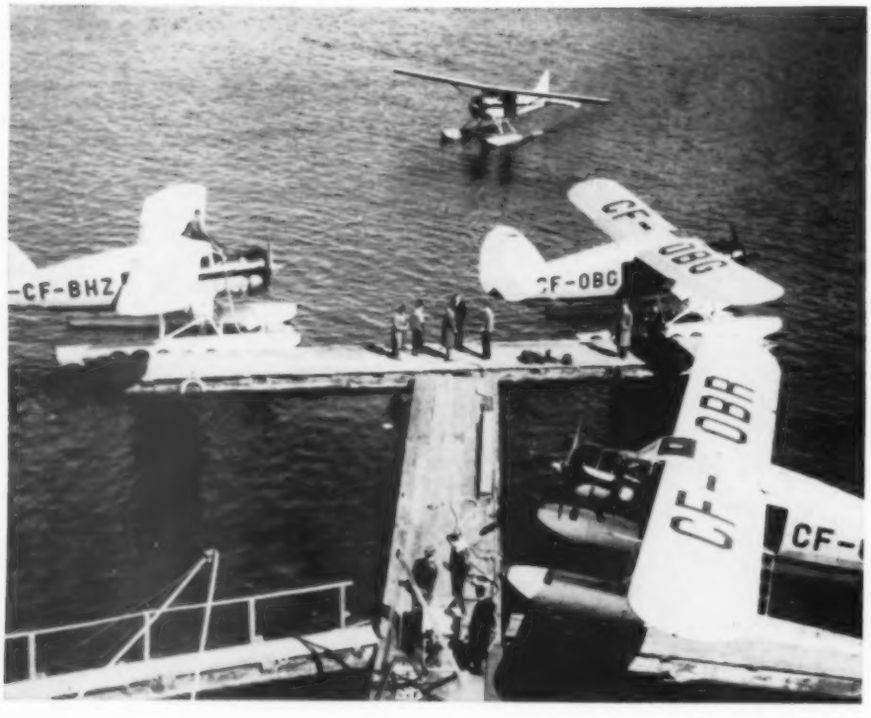
One of the several new paint jobs seen on new-model Aero Commanders at the factory in Oklahoma City. New 560E tops 222 mph. and cruises 210 mph. on 70% hp. and 182 mph. on 55% hp. at 10,000 ft.

—(Aero Design Photo by Wayne Entriken.)

Russ Baker's fleet of 73 airplanes includes this 1948 Beaver, the first one sold by de Havilland of Canada. It gets off high-elevation lakes, such as this one, at 5,000 ft., in 16 secs. with full load.
—(de Havilland-Canada Photo.)

From Bush To Big-Time

By SANDY A. F. MacDONALD



Some of the floatplanes in the great Alcan airlift by which Baker shuttled construction materials and crews between Vancouver and Kemano in building the giant aluminum smelter and power project.
—(de Havilland-Canada Photo.)

AS it has always been, Canada is still a challenging proving ground for airmen with a formula for combining air service with good management into a successful business enterprise. Distances are great and resources are being developed with an increasing need for fast, efficient air transportation.

Every few years a Canadian airman with the know-how in flying and business operations forces his way to the front among the far-flung industrial and bush-flight operations. The latest to reach the top is Winnipeg-born Russell Baker, 46-year-old ex-bush pilot veteran of the Bridge River gold rush of the mid-30's and former Canadian Pacific Airlines captain. Today, Russ Baker heads Pacific Western Airlines, headquartered at Vancouver, British Columbia, which he calls "the

Baker's bush planes connect the wilderness with his DC-3 and larger airliners at key air strips (above). At right is Tiedemann Glacier, flowing down from 13,260-ft. Mt. Waddington. Baker's Beavers used a similar glacier as an airstrip to deliver 300 tons of supplies for the Granduc Copper Mine.
—(de Havilland-Canada Photos.)

world's fastest growing airline."

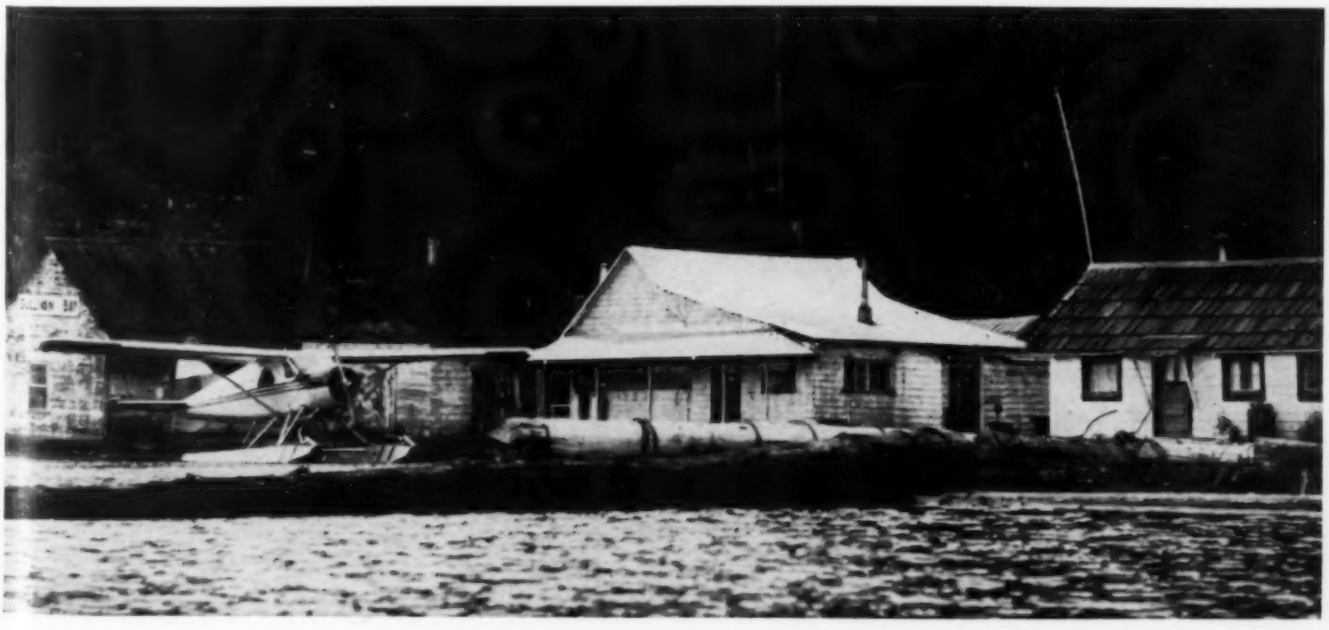
Like many another Canadian airman, Baker was a licensed pilot at 16, flying prospectors and supplies in the wilderness as soon as he could acquire an airplane or a job. Like others, he also graduated into an airline captaincy, becoming a Canadian Pacific divisional superintendent at 35 before brushing aside this impressive achievement in 1946 to locate a financial backer (Mining Executive Karl J. Springer) and start all over on his own. Baker's "own" began on a modest scale in a small Stuart River shack near Fort Saint James, an early-model much-used Beechcraft floatplane his one and only aircraft.

British Columbia's postwar boom gathered steam the year Baker went into business and in 1947, after he won a government forest service contract for fire suppression flying, his Central British Columbia Airways, Ltd., acquired six additional airplanes and in 1948 he acquired five additional seaplane bases from which to spread his operations out of Fort Saint James. This opened the floodgates for new business in charter, air taxi and forest service flying and more airplanes were acquired. It was in 1948 that the first Canadian postwar airplane design for bush flying went into production and Baker purchased the original — de Havilland's new 450-hp. Beaver, which could handle profitable loads from small lakes at 5,000-ft. elevation. This original Beaver, registered CF-FHB, is still giving Baker excellent service after 9 years of continuous heavy duty operating from fresh water, salt water and even rough glacial ice.

By 1950, with several more aircraft added, including two more Beavers, and after B. C. Central was chosen by the Aluminium Company of Canada (Alcan) to survey Pacific Northwest sites for its huge Kitimat and Kemano projects, Baker began buy-

(Continued on page 49)

This is Sullivan Bay, typical of wilderness bases used by Beavers in supplying British Columbia coastal mining and fishing camps. The buildings are afloat on log rafts and include the home of the couple who operate the base, a radio station operated by the Standard Oil agent's wife and a small cafeteria for visitors
—(de Havilland-Canada Photo.)



Oklahoma University instructor and ROTC student.

ROTC Flight Training Trends

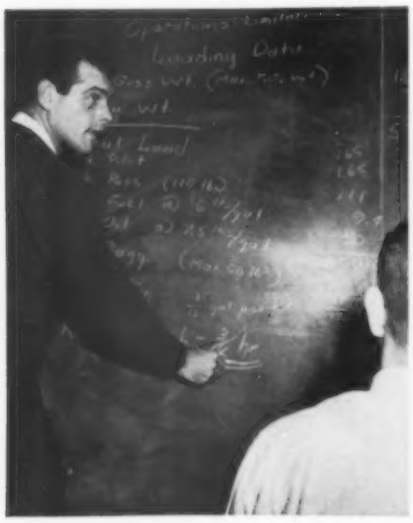
THE Air Force ROTC flight training program is going great guns in about forty colleges and universities. The Army ROTC flight training has been instituted in nine schools. The Navy is lagging, but at least started on a small scale at the University of Illinois and at Purdue, where AF and Army training is also being offered.

Having been cold on ROTC flight training from the first, the Navy's sudden request for training at two colleges probably means that they have accepted the program and will use it for screening purposes next year. This prospect was confirmed by a FLIGHT MAGAZINE editor during an interview with a high-ranking Navy training official at Pensacola last month who stated that the program should be worth its weight in gold in screening out non-pilot material. Results from Illinois and Purdue probably will have a great deal of bearing on Navy's future use of the program in some 50 NROTC units.

The Air Force got its program under way through negotiation of contracts and a mass meeting of university business officers at Maxwell Air Force Base. The representatives of the Air Force did a good job in explaining to the university people the whys and wherefores of the government contract and met some objections as best they could. The main bone of contention was the desire of some of the university officials not to handle the program as a contractor even though they could sub-contract the flight training out to commercial operators. The result was the Air Force agreed to look over the situation but all agreed nothing could be done to change it this year. Subsequently the secretary of defense took the position that the services could not, except in most unusual cases, make direct contract with the flight operators.

University officials from institutions with long experience in flight training operations agree the only way is to do the job themselves. They feel that any other approach would result in loss of control of the students as regards scheduling and discipline, that the colleges have taken responsibility for ROTC programs and should not shirk the full responsibility.

One major problem right now is with the Army. They have limited payment for the 36.5 hours of flight and 35 hours of ground school, including transportation and insurance, to $500. This is not high enough for other than 65-horsepower aircraft and mighty close to operating costs of 65-hp. trainers. The Air Force negotiated contracts in some cases for training in Cessna 170's and 172's at a fair price but it is feared the Army pay scale and perhaps a low Navy pay scale might knock down the AF price. Since the program will depend upon annual appropriations it is hoped by all the participants that a fair and reasonable rate will be provided so that proper training equipment can be used and a real effective job turned out. At schools where flight training programs are already established and running, the cost of training ROTC students



Ground school (left), sign-out for hop and line inspection before a flight.

Familiar sight at some fifty universities and colleges, trainers such as this Oklahoma University Champion are becoming numerous as the ROTC flight program gathers momentum.

is bound to be considerably less than in schools where they must start from scratch. In about two or three years, when the new schools catch up with the old established flight training curricula schools, the cost should level out and probably will settle down to about $16 per hour for instruction in adequate airplanes.

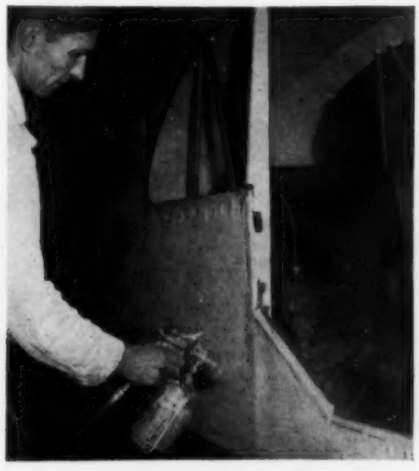
One school official believes that the Air Force has no interest in whether or not the graduates of the training receive a private pilot certificate. They overlook the fact that from six to nine months of time usually elapses from the time the cadet graduates and is commissioned and before he enters pilot training. They fail to realize that if he has a certificate he probably will continue flying on his own during the time lapse. Some believe that the Air Force intends to give all the students flight training no matter the outcome of the ROTC training they receive. So the complete record and full appraisal of each student by the college will be of utmost importance when the military services assess the value of ROTC flight training.

In the case of training for the Army, it is apparent that ROTC training might actually replace some of the training the students would get in the first months at Army flight school, since the type of equipment and kind of flying are so similar. So the dollar value of the training may be greater for the Army than for the other two services.

Like any other service or commodity, the military services are only going to buy something that produces results — at a reasonable rate. If the contracting schools are forced to go

(Continued on page 48)

Students and mechanics are alert to airworthiness.



Champion Aircraft's new Tri-Traveler with nose-wheel is pictured above, with the interior at right showing how Champion completely upholsters the tandem 2-place cabin of both the Tri-Traveler and the Traveler with tailwheel.

Two-Place Comeback

CHAMPION Aircraft Corporation, which delivered 162 airplanes during 1956, reports a revival in the demand for new-production 2-place utility airplanes and trainers at its new plant at Osceola, Wisconsin.

Champion Tri-Traveler and Traveler De Luxe

Factory Data

	Tri-Traveler	Traveler DL
Price	$5,875	$5,475
Seats, Tandem	2	2
Continental 90C-12F, hp.	95	95
Gr. Wt., lbs.	1,500	1,450
Empty Wt., lbs.	968	929
Useful Ld., lbs.	532	521
Bag. Cap., lbs.	50	50
Fuel Cap., gals.	26	26
High Spd., mph.	135	135
Cr. Spd., mph.	108	112
Landing Spd., mph.	40	40
Rate of Climb, fpm.	900	900
Range, miles	500	500
Wing Span, ft.-ins.	35-2	35-2
Length, ft.-ins.	21-8	21-8
Height, ft.-ins.	8-8	7-0
Wing Loading, lbs. sq. ft.	8.8	8.8
Pow. Loading, lbs. hp.	16.5	16.5

NOTE: Standard Traveler priced at $4,875. Tri-Traveler and Traveler De Luxe prices and weights include generator, battery, voltage regulator, ammeter, recording tachometer, sensitive altimeter, oil temp. gauge, oil pressure gauge, compass with cover, airspeed indicator, heater, engine primer, all-metal prop, spinner, dual controls, fully upholstered and soundproofed cabin, adjustable front seat, air-ride cushions, full-shielded electric system, hydraulic service brakes, parking brake, wheel pants, landing and navigation lights.

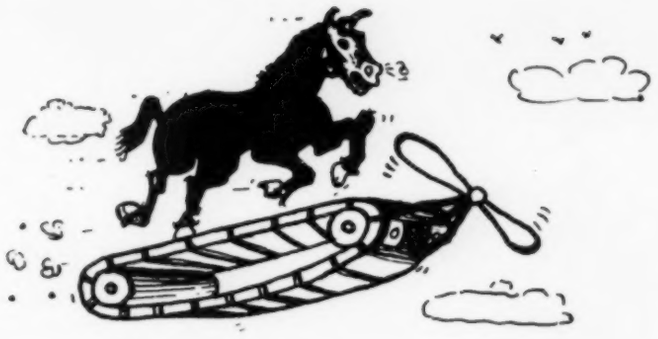
Prices are $4,875 for the standard trainer Traveler, $5,475 for the Traveler De Luxe and $5,875 for the Tri-Traveler, the Traveler De Luxe and Tri-Traveler featuring as standard many extras formerly available only as optional at additional costs.

Top-notch performance has been given the Champions with the 95-hp. Continental 90C-12F four-cylinder engine. This engine has been perfected down through the years and some users report operating it over 1,000 hrs. between overhauls. At this rate, engine maintenance and overhaul is down around 50 cents per hour and less. A cruising speed of 108 mph. on 5 gals. of fuel per hr. or so is also genuine economy.

Ease of flying ranks with economical performance as the Champion's major feature and has been greatly enhanced by perfection of a nose-wheel installation for the Tri-Traveler model. With a landing speed of only 40 mph. and a 900-fpm. rate of climb, these airplanes are operated out of very small fields, becoming airborne within 300 ft. on take-off and being stopped within less distance on landing. Hydraulic brakes and even a parking brake are standard equipment and Champion has perfected a new no-bounce oleo landing gear which facilitates wing-down landing in cross-wind conditions.

But the most impressive feature for people viewing the new Tri-Traveler and Traveler De Luxe for the first time is their finish, obtained with closest attention to details. Soundproofing is good, foam rubber cushions are comfortable and even the front seat is adjustable by a dial located in front of it. The cabin is fully upholstered and wrap-around windshield and large windows furnish control-tower visibility. All the 26-gal. fuel capacity is in the wing. Quadrant-type throttles are on the left sidewall for both front and rear seats and dual stick controls are used. The attractive plastic instrument panel is shock-mounted with rubber. Fire-resistant butyrate is used for the finish — 17 coats of it for mirror-like finish in beautiful color combinations.

Horsepower At Altitude



By BOB MacGREGOR

A FEW days ago, an old-timer was recounting an interesting early flying experience. Bona fide aircraft engines were hard to come by before the day of the Continental A-40, and flying time in those days usually included a hop in something powered with an automobile engine. The case in point concerned a Model A Ford engine, and it seems the aircraft reached its service ceiling about 500 feet above the field. An inquiry as to field elevation revealed it to be about 4,000 feet msl (4,000 ft. above mean sea level), so the aircraft actually made it to 4,500 ft. altitude, as it must be reckoned for purposes of air traffic control, cross-country terrain clearance, and engine power control.

This latter item, power control at altitude, is one that takes a bit of understanding for best results. It is important not only for cruising economy, but improper engine operation can make for early overhaul. It can be so inconvenient to have the engine of a Cessna 182 or Beech Bonanza become definitely due for a major while over the Dakota Bad Lands.

To pick up a few highlights before getting into the meat of the thing, consider the following quote on use of mixture control from Continental C125-C145 operating instructions:

> "The mixture control should not be used under 5,000 feet (mean sea level). When adjusting mixture control for altitudes higher than 5,000 feet, move control in and out slowly, with the throttle at cruising or full open position until the highest rpm. is attained. The carburetor mixture will then be correctly adjusted for all throttle positions and loads at that particular altitude."

It is understood, of course, that quote applies to an engine equipped with a propeller whose blade angle remains constant during the mixture adjustment. Virtually the same procedure applies to any aircraft engine having a manual mixture control, and without constant-speed propeller. Examples would include the Piper Pacer, Cessna 170-172, Globe Swift GC-1B, and others frequently found in current operation.

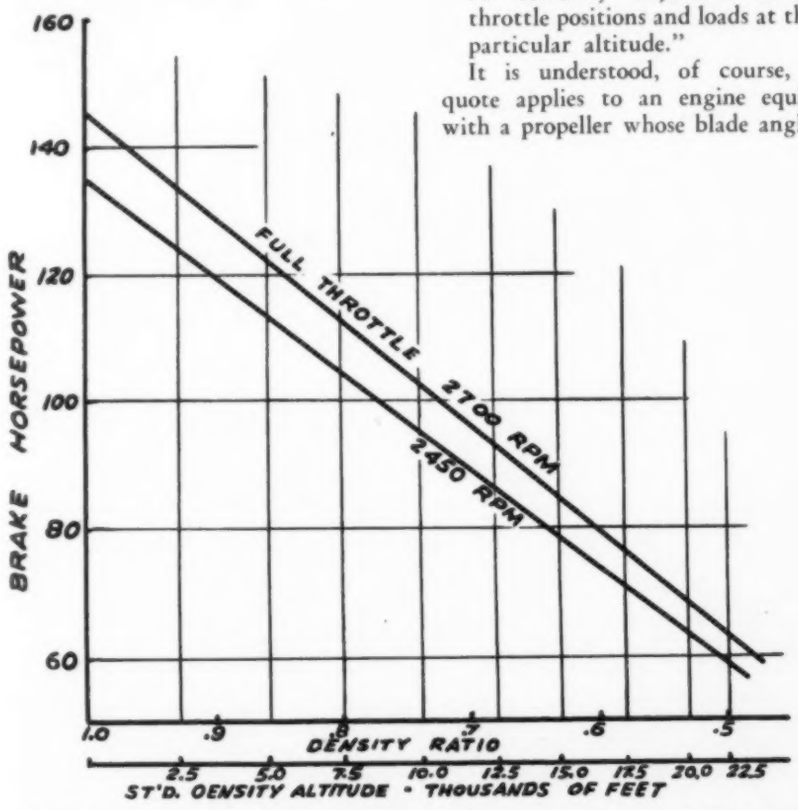


FIG. 1 — Horsepower vs. altitude for Continental C-145, full-throttle, constant rpm.

One question arising from this manual leaning procedure might be, "Why the specific altitude of 5,000 feet?" At that altitude, the maximum output (2,700 rpm.) of the engine has dropped to about 122 hp., and maximum cruising potential is down proportionately (see Fig. 1). We have reached a level where power capabilities are such that unwise manipulation of the one variable, the throttle, will not hurt an engine manually leaned as per instructions.

The engine we are discussing is usually equipped with what is referred to as a "simple" carburetor. It is responsive to rate of flow of air moving through it (cu. ft. per min.) as controlled by the throttle, and meters fuel into the air in proper proportion. This simple carburetor also compensates, to a certain extent, for the decrease of air density with altitude, but it can't quite do a complete job, and the mixture gets richer until, at about 21,000 feet, the engine would get approximately a 42% overdose of fuel. At 5,000 feet, we should start doing something about the increasing richness, since at the 5,000 to 6,000-foot level performance is suffering a bit from excessive fuel. Leaning the mixture improves performance, and an increase in rpm is noted. Worth mentioning is cylinder head temperature, since a pilot is frequently advised to watch for a rise which might indicate a lean mixture. The head temperature gauge must be used wisely, because in manual leaning carried a bit further than the first indications of rpm. change, a head temperature *decrease* may be seen. This effect was noted personally, not long ago, where another pilot and I were experimenting with manual leaning of the mixture control in an Aero Commander. The tempera-

How to cool a pilot in the Thermal

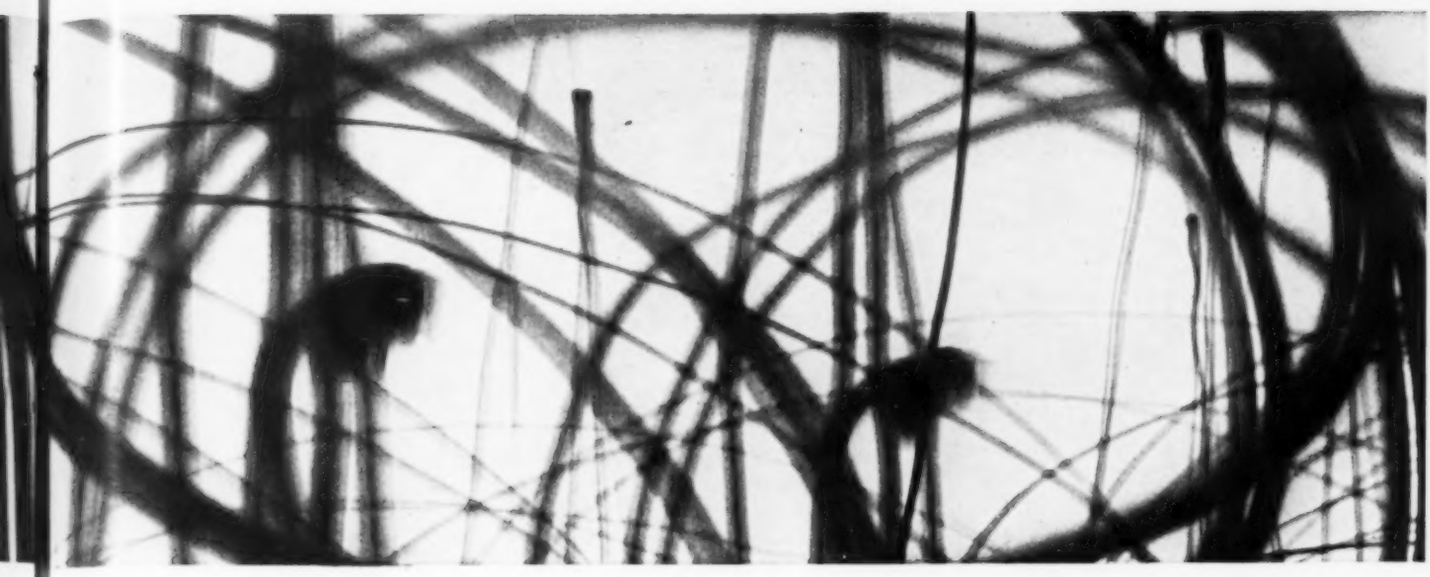
The Douglas X-3, used in heat dispersion studies.

With aircraft that top 1000 mph now in military service, the problem of *heat dispersion* gets growing attention from Douglas engineers.

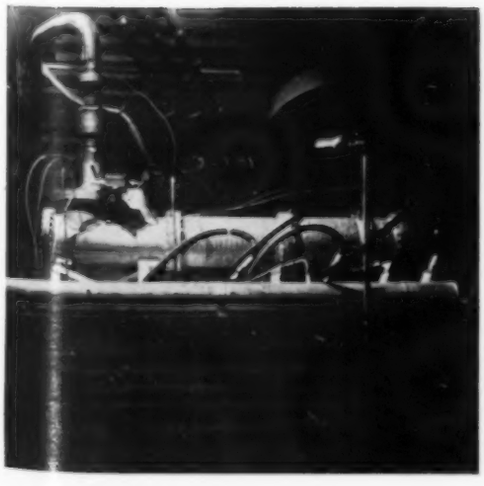
Once called the heat barrier, science now uses a more accurate term, *thermal thicket.* The faster you fly through the earth's atmospheric blanket, the further into the thicket you get . . .

At Mach 2, twice the speed of sound, a plane's skin temperature can reach 275°F. At Mach 3 it leaps to 650°F, and at Mach 5 hardened steel wilts like lettuce . . .

Douglas is attacking this heat problem on many fronts. Air conditioners powerful enough to cool a theater were tested in the famous X-3 research plane seen at left. In current Douglas missiles, amazing advancements are being made in the design of heat-resisting materials and structures. This knowledge will speed the solution of the thermal thicket problem for piloted aircraft.



Thicket



The Douglas Aero-rotor, an instrument that blasts out high velocity gas at temperatures upward of 3000 degrees Fahrenheit, helps in research for materials to withstand high temperatures and jet velocity erosion. Other work now on the boards at Douglas ranges from designs for the practical application of atomic power to the complete design and building of intercontinental missiles — and even includes the engineering for a space platform first considered as early as 1946.

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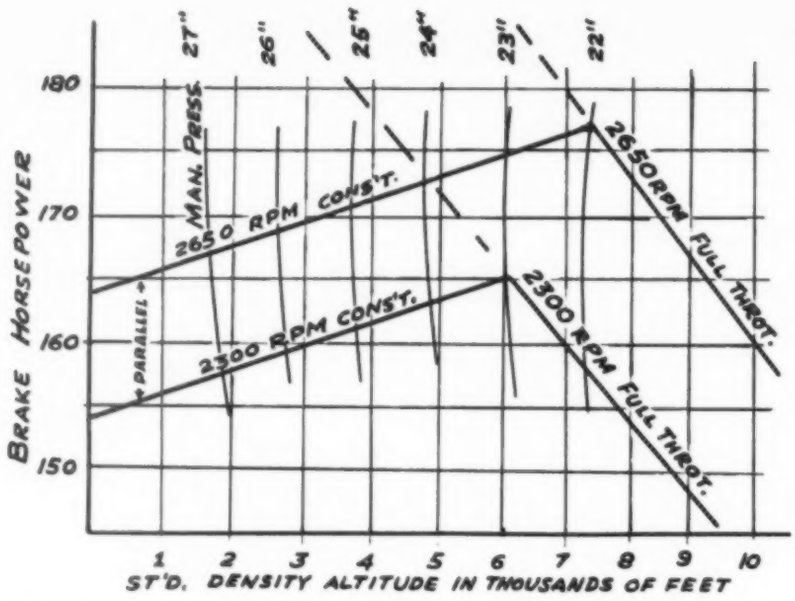


FIG. 2 — Power vs. altitude at constant rpm. for Continental E-225.

ture reduction is due to the fact that, since less fuel is put into the engine, less power is developed, and it runs cooler until the detrimental effect of the excessively lean mixture makes itself known.

Let's take a look at some specific applications involving theoretical considerations. We are just going to skim the top of the subject, but it should be a start for any serious student who wishes to explore all the ramifications of being a thorough pilot.

The four following items are worth emphasizing, since they are used as a basis for Figures 1 and 2.

A. Air density decreases with altitude. Since the weight of a cubic foot of air is less at altitude, proper combustion requires less pounds of fuel be mixed with the air. It follows that the power output goes down — put less stuff into the engine and you get less stuff out.

B. Altitude factors affect engine volumetric efficiency. This term can best be explained by saying that a Continental E-225 has room to suck in 471 cubic inches of mixture in two revolutions. If, because of poor exhaust scavenging, intake pipe losses, etc., it only gets 377 cubic inches into itself, it is said to be operating at 80% volumetric efficiency.

C. "The values of horsepower at constant rpm. form a straight line when plotted against manifold pressure at sea level . . ."

D. "The values of full throttle horsepower at constant rpm. form a straight line when plotted against standard altitude density ratio, and all lines intersect at zero horsepower and .117 density ratio — 55,400 feet."

The last two items are quotes from an article by E. F. Pierce, which was a part of the Wright Aero Corp. Service Lectures.

Let's stop for a look at item D. Interestingly enough, it tells us a piston engine — any piston engine — is all done at 55,400 feet density altitude. It also gives us the basis for the commonly used relation that full-throttle, constant rpm. horsepower will decrease from sea level to about 47% of that value at 20,000 feet.

This has been put to a practical application in Fig. 1, which shows power versus altitude for a Continental C-145 engine. This is an engine such as is used on the Cessna 172, having only a throttle for direct power control, and fitted with a fixed-pitch prop. Take-off rating of the engine is 145 hp. at 2,700 rpm. at standard sea level conditions. In Fig. 1, it is assumed the aircraft takes off and climbs at full throttle. Immediately after breaking ground at this sea level field, the air speed is so controlled as to keep the rpm. at 2,700. The horizontal axis of Fig. 1 shows both air density and altitude. As the airplane gains altitude, the horsepower decreases along the line.

Two horizontal scales will be noted in Fig. 1, the altitude density ratio and standard density altitudes in thousands of feet. The power shows as a straight line when plotted against density ratio, while the altitudes, corresponding to the proper density ratios, tend to "bunch up" as altitude increases. All power curves have this "bunching-up" (or "non-linear", as mathematicians call it) characteristic of altitude scale.

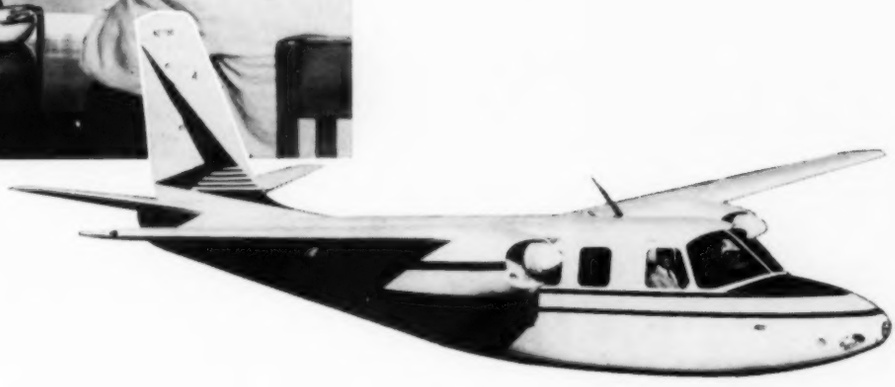
If the airplane were climbed at full throttle with the air speed regulated so as to maintain a constant 2,450 rpm., which is the recommended C-145 cruising rpm., the power would decrease with altitude as shown in lower line of Fig. 1.

Now, what is happening in Fig. 2? A few paragraphs back we mentioned volumetric efficiency, and the fact it has a bearing on power at altitude. If we keep manifold pressure constant on an engine, and reduce back pressure on the exhaust system, it follows that exhaust scavenging will be improved, volumetric efficiency will be increased and, hence, power output will increase. This is exactly what happens, as shown in Fig. 2. The engine depicted is the Continental E-225 (listed with 2,300 rpm. at 23 inches as sea level cruising power), and was used as an example for sea level power setting selection in a previous article. For this illustration, let us consider maximum cruising power is 154 hp., available with 2,300 rpm. at 23 inches manifold pressure at standard sea level. If the airplane is climbed at these settings, the power will increase along the line shown until the throttle is full open at 6,000 feet altitude. If the airplane is climbed beyond that point, power will decrease along the full-throttle power line previously discussed.

Hold on a bit here. If we are allowed 154 hp. at 2,300 rpm. as maximum cruising power, and power increases with altitude if we maintain constant manifold pressure, we are obviously going to exceed the power limit unless we make a manifold pressure adjustment in the area between sea level and full-throttle operation. As higher cruising flight levels are attained, a reduced manifold pressure setting is required although, in the climb, atmospheric pressure drops off fast enough with altitude so that we must be continually opening the throttle to obtain the reduced setting required.

To obtain, for example, the required manifold pressure for 154 hp. at 2,300 rpm. at 4,000 feet above sea level, we must know how to use the power curves. Refer once again to the constant manifold pressure power increase line shown in Fig. 2. The example chosen was 23 inches at 2,300 rpm., but the line for any constant combination would have been parallel. For demonstrating this, the power increase for 22 inches at 2,650 rpm. is also shown on Fig. 2. Since the lines are parallel, we need only one such line on the chart to determine settings for any particular power output at altitude.

The problem we want to get around



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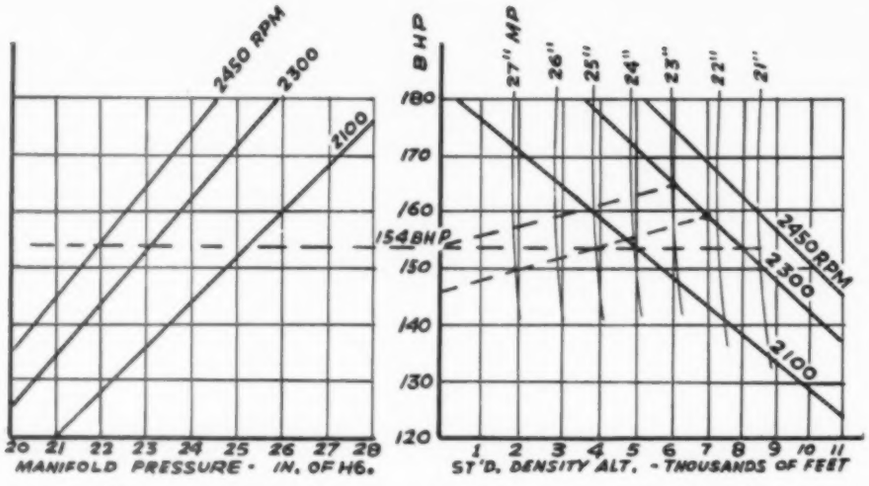

FIG. 3 — Settings for a given power at a particular altitude.

to solving here is what manifold pressure is necessary at 4,000 feet to give us 154 hp. at 2,300 rpm.? To do this, we draw the constant setting parallel line through 154 hp. at 4,000 feet, and note the full throttle 2,300 rpm. intersect (22.2 inches) and sea level power curve intersect (22.2 inches). This data is shown on Fig. 3, and tells us that at sea level we get 146 hp. from 2,300 rpm. at 22.2 inches manifold pressure, and with this setting held constant in climbing, the power would increase to 154 hp. at 4,000 feet.

Summarizing, to get 154 hp. at 4,000 feet at 2,300 rpm., we want 22.2 inches of manifold pressure. Similarly, at 6,000 feet, we want 21.8 inches manifold pressure, and at 8,000 feet, we have the throttle full bore at 21.5 inches. Now try a problem of your own, for kicks. We are economy-cruising a Bonanza with E-225 engine at 2,100 rpm. at 6,000 feet altitude at standard conditions, and we want an output of 135 hp. What manifold pressure do we set up? (Answer at end of article).

No mention has yet been made of air temperature, since our purpose here was primarily how to get data from power curves. Density altitude is pressure altitude corrected for temperatures, hence note the following quote of an old thumb rule:

"Correct horsepower in accordance with air temperature by applying the following: (a) Decrease manifold pressure ½ inch for each 20° F above standard temp.; (b) decrease manifold pressure ½ inch for each 20° F below standard temp." Now, in applying this rule, it must be remembered we are concerned with carburetor air and this is affected by such things as carburetor heat.

This temperature correction means the "density altitude" of the horizontal scale of the power curves need not stump us. We just take the altitude reading from the *properly set* aircraft altimeter, use it in the power curves, and, after the hp. correction for difference from standard temperature, we are in business. A scale showing standard temperature for altitude is included at the bottom of published power curves.

Before somebody becomes concerned about a data difference, we might explain the power curve data herein presented was from a Continental E-225 power curve sheet dated 2-11-53. Though a published cruising rpm. may change, the process for using the power curves remains the same.

In a previous article, we demonstrated the use of sea level power curves, explaining how the variable of engine speed (rpm.) was fixed by bmep considerations. For power at altitude, an rpm. can be chosen the same way. If a low, or economy, cruise power is to be used, the rpm. should be chosen accordingly since, regardless of power, we should use a bmep right up at the safe cruising figure. Based on current Continental data, the E-225, on 80-octane fuel, will conduct itself nicely at a cruising bmep of 115 psi., give or take a few pounds. With the power and rpm. selected, the manifold pressure to produce that power at altitude is obtained from the power curves as just explained. Most manufacturers would supply engine power curves for seriously interested users of their engines.

Now, ask about those new superchargers: Because of the increase in **volumetric efficiency**, the supercharger far more than makes up for the power it takes to drive it. The aircraft engine comes by a natural efficiency increase with altitude and, in the reduced density of the upper air, the supercharger more than pays for itself. Every airplane should have one. Without a supercharger, the engine puts out the most it can do at ground level, and from there on up, the power drops off, as in Fig. 1. With a supercharger, rated ground level power is available right up to a standard altitude of 8,000 ft. in the case of the GSO-480 Lycoming, for example.

These beneficial devices are never without some penalty for injudicious operation. In this case, the power potential at sea level is so great the engine can literally burn itself out at low altitude. This strictly forbids full throttle take-offs as in the case of the C145 discussed in Fig. 1. (except from a very high elevation field.)

The Lycoming GSO-480 used in the Aero Commander Super 680, for example, has a sea level take-off rating of 340 bhp., but is theoretically capable of putting out about 450 hp. at that level. Lycoming has produced a compact engine with excellent altitude potential, but as in the case of all supercharged aircraft engines, the low-altitude capabilities require some understanding on the part of the pilot or the durability can be adversely affected.

The GSO-480 has been made economical and simple to operate. The mixture control has only two positions as compared to four such detents in the P & W 1830 powered DC-3.

The Stromberg carburetor on the subject engine has an automatic "power enrichment valve" which begins to act when the mass air flow through the carburetor reaches 1,750 lbs. of air per hour. If the engine were to be operated at relatively high power output without exceeding this 1,750 lb.-hr. airflow, and it is possible to do so, we would be demanding power without mixture enrichment and its attendant benefit of detonation prevention. This enrichment factor is true with any supercharged aircraft engine, and boils down to the necessity for a pilot to acquire an understanding of brake mean effective pressure — bmep. It is a sorrowful thing, and pardon us for mentioning it, but while pilots may have vast knowledge of elasticity factors of a chorus girl's garter, hardly five out of ten can tell you the meaning of the term bmep. That GSO-480 met the approved type specification, so we should not blame the manufacturer entirely when possibly a little more pilot knowledge would help prevent a burned piston.

(Answer to Bonanza cruising problem: 21.6 ins. of manifold pressure with 2,100 rpm. gives 135 hp. at 6,000 ft., standard conditions.)

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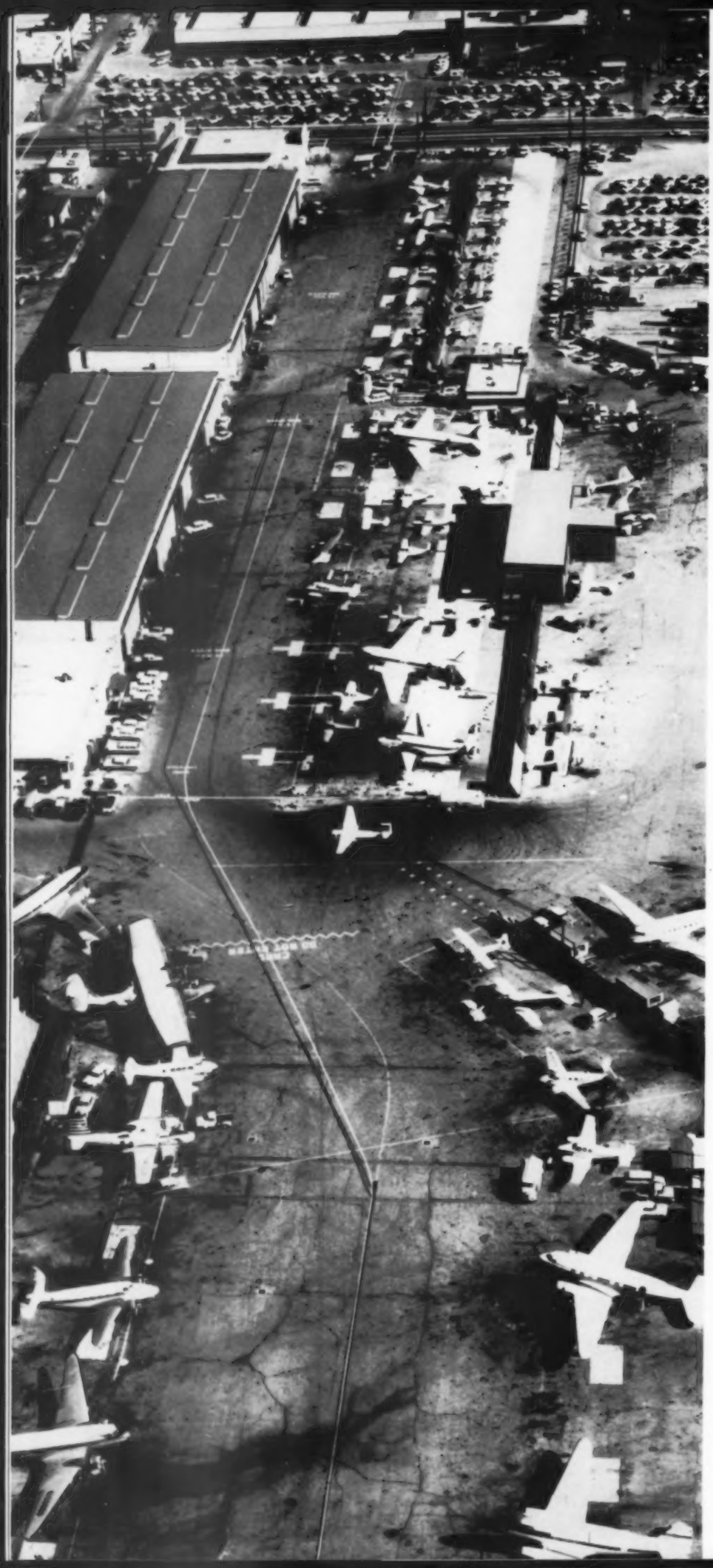


BULGING AT THE SEAMS with corporate aircraft work, Pacific Airmotive's Burbank headquarters are seen at left. Above is the firm's newly-acquired PacAero Learstar operation at Santa Monica. John W. Myers, chairman, reports PAC's 1956 operations were the most successful in the firm's 28-year history with sales of $21,254,921.

NATIONWIDE ROUNDUP:

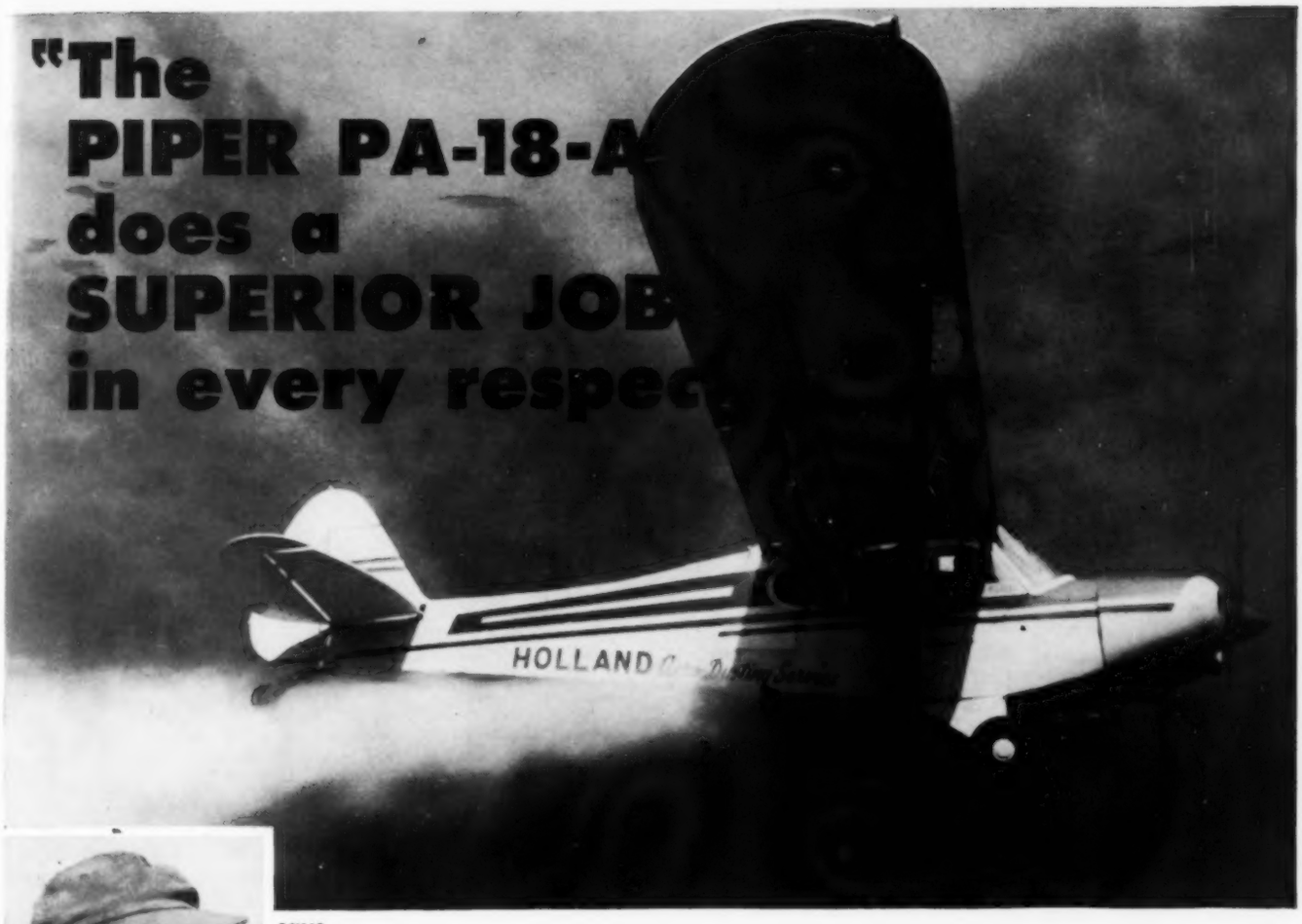
New Business In the Hangar

PACIFIC AIRMOTIVE CORPORATION at Burbank has completed extensive modifications to Pittsburgh Consolidated Coal's Douglas B-23. PAC has also completed extensive modifications to Bethlehem Steel's Pennsylvania-based Lodestar captained by Al Jonker and recently delivered a new DC-3 to Aerojet-General Corp. after building it up from major components which had never before been a part of the same airplane.

Highlighting the B-23 modernization for Pittsburgh Consol were installations of a Bendix X-band weather radar, complete autopilot system, double-engine change, propeller and accessory overhauls, side-mounting of pitot masts and relicensing with 100-hr. inspection. Reconstruction of the nose properly streamlined the radome into the fuselage. Chief Pilot Lewis Ramey uses the B-23 for longer trips with heavier loads and operates two new Beech E18 Supers for shorter trips.

The Bethlehem Steel Lodestar received DC-3 type collector rings and short stacks with 50,000-BTU Janitrol heaters in the nacelle areas formerly occupied by the tail pipes. It also received PAC flush fuel dump chutes and relicensing with 100-hr. inspection. The Aerojet-General DC-3 was built up in four and one-half months and on schedule from separate fuselage, wings, tail section and other C-47 units all from different airplanes, being assembled for completely-new systems and equipment throughout including over 1,600 ft. of tubing and 3 miles of wiring.

REMMERT-WERNER reports four new DC-3 conversions and sales, with



says Jim Holland, Owner, Holland Aero Dusting Service, Homestead, Florida.

"I used to operate two Piper PA-18-A's and a Stearman. Because the Pipers have done such a superior job for me and my customers in every respect, I am now operating three Pipers and no Stearmans.

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"My first Piper PA-18-A put me in business with B & L Farms. They say that the Cubs have given them closer coverage and better distribution than any other aircraft used previously. Now I am doing 90 per cent of my work for B & L Farms and my three Cubs are being kept busy the year round.

"I am in business for my family, my wife and my two-year old son. I like the PA-18-A's because of their safety and economy.

"I prefer them because of their ease of handling and better control under full loads at slow speeds. Visibility forward, down and up (when flying under wires) is much superior. In the enclosed cockpit ahead of the hopper the pilot is in less danger of being exposed to dust. The dust can't interfere with his visibility.

"The new, modern airframe and engine are more reliable and assure safety with greater economy.

"Loading the hopper from ground level is easier, faster and safer. During reloading the pilot may remain in his seat making a cockpit check while his helper is filling the hopper.

"I have 360 hours on one of my PA-18-A's without any maintenance whatsoever, aside from periodic checks.

"The Cub carries 800 lbs. of 'Nugeen' fertilizer, which is equal to the capacity of the Stearman. It carries 900 lbs. of dusting sulphur or 110 gallons of spray. The output is 800 lbs. of dust every 18 to 20 minutes.

"Flying down the rows on a flagman in a Piper is more accurate because of the better visibility. There is less waste in overlaps and there are fewer misses. Above all, the PA-18-A's use exactly one-half the amount of fuel burned by the Stearman putting out the same poundage.

"On my days off I use the Cub to fly to out-of-the-way places for fishing."

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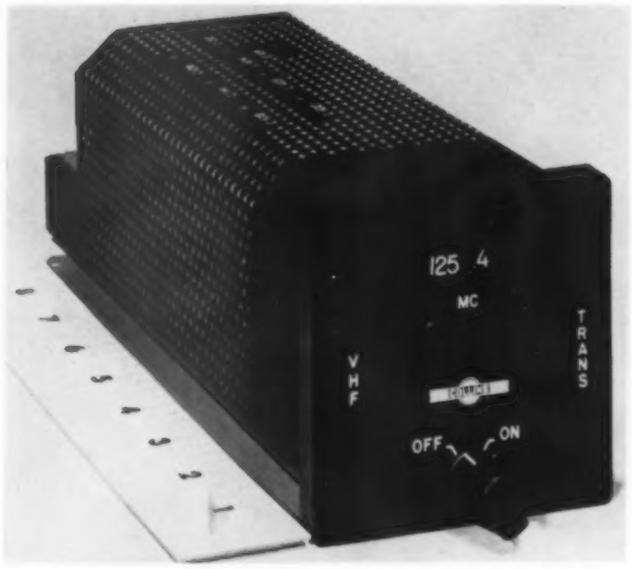

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the coming of spring bringing customers who always start buying airplanes when the birds start chirping. Hollister Mills of Norwood, Mass., bought Bill Remmert's new Super 92 DC-3 demonstrator at Pompano and it features the new Remmert-Werner Flightweight landing gear doors and retractable tailwheel. Maurice (Fierce) Pierce of the R-W staff will be flying it until the new owner's captain takes over.

Another new DC-3 conversion was completed for the much-flying Banco de Mexico, whose chief pilot, Major Carlos Carduno, spends a lot of time in the States buying airplanes for the bank. This was the second DC-3 delivered to them recently by Remmert-Werner and their fourth or fifth new airplane acquisition in the last seven months.

General Mills of St. Paul, with Bill Stone doing the flying, received Pompano delivery of its new Remmert-Werner DC-3 with RCA radar, while another new R-W 3 went to Don Heussler of Buffalo, for whom Jack Prior is captain. It features Collins autopilot system and Bendix X-band radar. Other recent R-W jobs included a third Custom 18 Beech conversion from Pompano for Henry Boggess at Sinclair Refining; Bendix X-band radar and Collins radio installations for Tracy Service's L-O-F DC-3 at Toledo; a new interior, new paint and radio installations for John W. Galbreath's Lodestar, flown by Bill Rosta, at Columbus, and a new interior and overhaul for Dick Rigg's Owens-Illinois Glass DC-3 at Toledo. Fleet sales of Engine Works' Super 92 engines have been made to Canadian firms including Hollinger-Ungava mining interests and Goodyear, and in the

NEW LANDING GEAR DOORS are being marketed by Remmert-Werner, which says they added 10 mph. to their DC-3 demonstrator and cut fuel consumption 3-5 gph. Furnished and installed at $3,750, they cannot foul or jam the gear, impose no hydraulic load, open and close quickly on minimum power in take-off or landing, fit flush with no extra frontal area or exposed lines or fittings.

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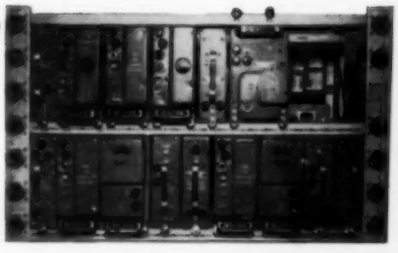

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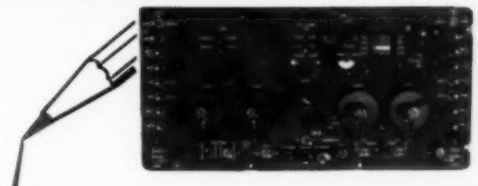

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CERTIFIED BEECHCRAFT SERVICE offers many extras to the aircraft owner — extras that do not appear on the service or maintenance bill. But these little extras mean a big saving through the year.

A good example of one of these extras is the CLOSE INSPECTION your airplane receives while it is being serviced on the ramp of a CERTIFIED BEECHCRAFT SERVICE STATION. Trained service personnel will spot — and call to your attention — any mechanism that is not functioning properly thereby eliminating costly repairs later.

CERTIFIED BEECHCRAFT SERVICE technicians, with their long Beechcraft experience and factory training, know your Beechcraft from front to rear. But most important, they take a personal interest — and pride — in seeing to it that your Beechcraft serves you well.

So when your Beechcraft requires service — bring it to one of the CERTIFIED BEECHCRAFT SERVICE STATIONS listed — where it's always *"in good hands."*

AIRCRAFTCO, INC.
New Municipal Airport
Wichita, Kansas

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ANDERSON AIR ACTIVITIES
General Mitchell Field, Milwaukee, Wisc.

ATLANTIC AVIATION CORP.
Teterboro Airport
(25 minutes from Times Square)
Teterboro, New Jersey
Logan Airport, East Boston, Mass.

ATLANTIC AVIATION SERVICE, INC.
New Castle County Airport, Wilmington, Delaware
Philadelphia International Airport, Philadelphia, Pa.

BUTLER CO., AVIATION DIVISION
Municipal Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

ELLIOTT FLYING SERVICE
Municipal Airport, Davenport, Iowa

LOPEZ GRACE AVIATION, INC.
Building No. 3 and No. 18
Broward County International Airport
Fort Lauderdale, Florida

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

J. D. REED CO., INC.
Municipal Airport, Houston, Texas

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

We work so closely with Beechcraft owners in the maintenance of their airplanes, they have come to regard our service facilities as part of their own operation.

The '57 Beechcraft Bonanza — Best Ever Built!

PERFECTION Has Been IMPROVED!

More Power ★ More Speed ★ More Beauty ★ More Comfort ★ More Safety

A new 240-horsepower engine provides speeds up to *206* miles per hour! The Beechcraft Bonanza is still the *quietest* airplane in the skies. Select your own restful interior from more than three thousand color and fabric combinations.

No airplane is *easier* to fly — no airplane can match the scores of exclusives in the new, four-place Beechcraft Bonanza for '57. Here is Beechcraft's *"More Comfort Flight"* at its very best!

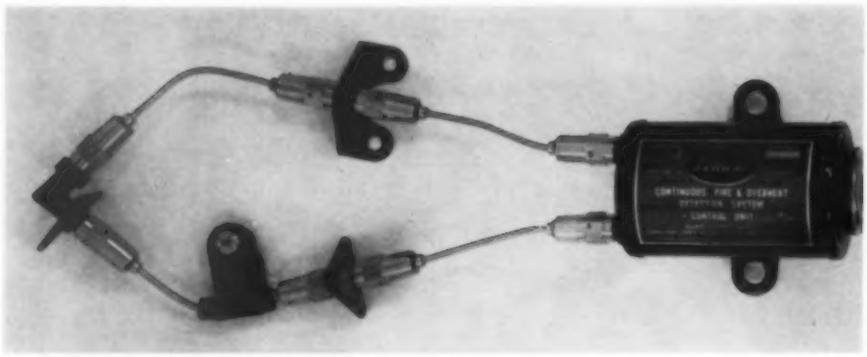
See your Beechcraft distributor or dealer today — and see the airplane that will do *more* for *you* than any other. *Your comparison is welcomed.*

Ask about Beechcraft's finance programs — there's one designed for you!

The BEECHCRAFT Bonanza
Flying 4 persons as far as 1,170 miles
at speeds up to 206 miles-per-hour.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



NEW FENWAL CONTINUOUS FIRE AND OVER-HEAT DETECTION SYSTEM features flexible detector cable and magnetic amplifier control unit, shown here as a mock-up with three types of connectors and mounting clips. Nickel wire inside cable is insulated by inorganic salts. Its accurate sensing at predictable temperatures will eliminate false alarms and eliminate "averaging" effects, says Fenwal.

Royal AMPHIBIAN NEWS

Notes on America's only all-new, twin-engine, supercharged, utility amphibian . . . for business flying and charter service operation.

IF IT'S PERFORMANCE YOU WANT — ROYAL GULL *SUPER 200* HAS IT!

CLIMBS FAST — FLIES HIGH —
25,500 ft Service Ceiling 2 engines
11,800 ft Service Ceiling 1 engine
Climbs to 9,000 ft in just 7 minutes

GETS THERE IN A HURRY —
208 mph High Speed
190 mph Max. Cruise (70% Power)

GETS IN AND OUT HANDILY —
50'
1440 ft — 20% flaps — sea level
14 seconds from water with 1930 lb useful load.
50'
1800 ft — full flaps — sea level

WITHOUT BEING GREEDY!
Over 900 miles
Cruise Range

PLUS the many other *SUPER 200* features. Write for Bulletin RG-200.

SEE *"the 200 MILE AN HOUR amphibian"* TODAY!

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A Subsidiary of KEARNEY & TRECKER CORP.
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FIELD AVIATION COMPANY Oshawa, Ontario, Canada
GULF AIRCRAFT SALES, INC. Houston, Texas
MARINE AIRCRAFT, INC. Detroit, Michigan
VERNELL AIRCRAFT Palm Beach County Airport, Florida
TIMMINS AVIATION LTD. Montreal Airport, Quebec, Canada
ROYAL AIRCRAFT SALES, INC. Milwaukee, Wisconsin

States to Nationwide Insurance for their second DC-3.

AERO CORPORATION OF ATLANTA is rebuilding the C. F. Johnson Lockheed PV-1 of Atlanta, of which Don Pennington is chief pilot. Specializing in X-ray aircraft inspection, Aero Corp. is establishing 10 classes of flat rates for 100-hour inspections including this work on aircraft ranging from DC-6's down to Cub-type lightplanes. Recent projects in the Aero shops included Lloyd Rondeau's S. Morgan Smith Co. Lodestar from York, Pa.; Minnesota Mining's DC-3; Barwick Mills' DC-3 of Atlanta; Texaco's Spartan from New Orleans with Dick Mansfield, pilot, and the Mine Safety Appliances' DC-3 from Pittsburgh with Pilot M. L. Nicholson.

The Garrett Corporation's **AIRESEARCH AVIATION DIVISION** at Los Angeles International Airport is installing the first Wilcox Canari system in an executive-type aircraft — a West Coast corporation's Convair 440. This lightweight system includes communications, navigation, marker beacon, glide slope receivers, ATC transponder and dual ADF equipment. The 440 is also acquiring a dual Collins HF communications system.

AiResearch is installing its complete maximizer kit on Michigan-Wisconsin Pipe Line Company's DC-3. Pilot Lloyd Bauer brought in the aircraft and is also receiving one-piece windshields, a 200,000 BTU heater and a refurbished interior.

Two Convair 440's, belonging to John Mecom of Houston and Ford Motor Company, are having TV sets installed and in addition, Mecom's Convair is being fitted with a high-fidelity tape system and an FM Transceiver for ship to company headquarters communications.

Pilots George Oswald and Steve Sandmayer have brought in the Morrison-Knudsen DC-3 for wing removal, corrosion inspection and re-installation, new aileron coverings, red and white cowl instrument lighting and edgelight installation on the radio switchpanel. Also new in the AiResearch shops is the Texas Company's D-18 Beech for control-surface covering and landing gear modifications. It was accompanied to LA by Aubrey Keif, manager of aviation sales.

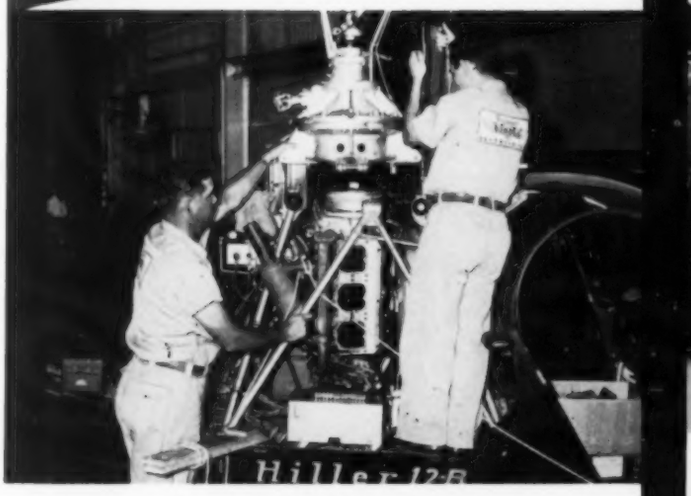
OHIO AVIATION at Dayton (Vandalia) reports more Lodestar work, including a conversion for Kolcast of Cleveland, with Bob Bercevich as pilot. It will feature a lightweight interior with picture windows, custom panels and raised bat wings at 13,500-lb. empty. Rework of a Bud Sidner Goodyear Lodestar from Akron includes new headliner with plastic attach strips for easy replacement of strips, new paint and Bendix flush loops, and Rags Ragland brought in Sheffield Corporation's Lodestar from Dayton for rework. Beech sales with custom installations include three new E18's for Ohio Oil at Findlay, a new E18 for Hanna Coal's Jim Gatz of

Special tools and equipment

Advanced technical know-how

As one of the nation's major overhaul and repair terminals, the J. D. Reed Company is constantly developing new techniques, equipment and processes resulting in a better job in less time at less cost.

J. D. REED COMPANY



Here at the J. D. Reed Company One-Stop Service Center we have the skilled technical personnel, facilities and equipment to do any job from periodic inspections to major overhauls on any type aircraft. In addition, we are specialists in radio and electronics installations and service.

You pay no more for our achievements in service and maintenance perfectionism, but you receive countless hours of enjoyable trouble-free flying with confidence in the unquestioned dependability of your aircraft through the unfaltering high standards of the J. D. Reed Company. Your personal experience will prove that it is good business to do business with the J. D. Reed Company.

J.D. REED CO. INC.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS

NOW APPROVED . . .

Winslow Full Flow Oil Filter

for installation on:

DC-3 (1830's)

Lodestar (1820's)

Twin Beech E 18 S (R985's)
. . . with CAA Supplemental Type Certificate.

NOW is the time to provide Full Flow Oil Filtration for these aircraft and reduce your power plant maintenance and parts replacement costs to the absolute minimum.

For Full Details, Local Dealer and Installation Service, call, wire or write:

PRECISION AEROMOTIVE CORP.

International Airport Houston, Texas Phone Mission 5-6636

Cleveland, 2 new E18's for Pittsburgh Consolidated Coal and a new E18 for Armco Steel.

L. B. SMITH AIRCRAFT CORPORATION at Miami has in the works what is expected to be "the quietest DC-3 flying." It is a conversion for Minnesota Mining of St. Paul and Mel Longlet and Don Richardson from 3M are living with the job, which features the 3M No. 435 sound deadener tape.

New in the LBS shops is a Convair 440 for a New York Corporation. It is receiving a Bendix analyzer and a complete new interior including 2 divans seating three each in a forward sleeping compartment; 2 double chairs with tables; 4 swivel chairs; 2 three-place divans in the rear and a circular lounge.

Ed Brush, formerly at Texas A & M College and widely known for some of his conversions, is now director of engineering for LBS.

Sales of LBS CW-20T Curtiss airliner passenger-cargo conversions now total 25, according to Herrol Bellomy. Prices vary according to specifications but average about $250,000, with 90-120-day deliveries. LBS recently bought 25 additional C-46's from the Navy for conversion. The first CW-20T in scheduled airline passenger service, operated by Northeast Airlines, was recently returned for its first 1,000-hour overhaul. Favorable passenger acceptance for it was re-

Champions for ROTC Flight Training!

Leading schools everywhere are ordering new, modern Champion Travelers and Tri-Travelers, America's lowest-cost 2-place production airplanes! . . . Dependable, long-life 95-hp. Continental power. . . . New, comfortable, tandem interiors, completely dual. . . . Control-tower visibility with Sky-vu wrap-around windshield, sunproof, tinted Clear-vu greenhouse, extra-big windows. . . . New no-bounce gear. . . . 26-gal. wing tanks. . . . low, safe landing speed. . . . cruising speeds to 112 mph. . . . dozens of exclusive features make Champion Travelers and Tri-Travelers America's greatest new-airplane value! For your low-cost, high-performance utility flying or school operation, buy Champion. Terms available — only one-fourth down, pay balance over 36 months.

Champion AIRCRAFT CORPORATION
OSCEOLA WISCONSIN

NEW NARCO SUPERHOMER features 12-channel VHF transmitter covering 121.0-123.0-mc range, tunable 108-127-mc receiver, omni system with 2-stage course selector and combination left-right, to-from indicator, and refined circuitry for greater accuracy and stability. It is self-contained, including power supply, in a unit priced at $499.50 and weighing only 10.7 lbs. installed, measuring 5¼ by 6⅞ by 10¼ ins. Over 8,500 Narco "homer" series units are in service now.

ported. First CW-20T's in Europe will be operated by Transair of Stockholm, which is receiving three of them with high-density seating for 56 passengers. Other airline operators of the CW-20T include Transcontinental of Argentina, Cordova of Alaska, Aerovias Q of Cuba and World Wide Airlines of Canada.

L. B. Smith has 9 Venezuelan Air Force B-25's in the shop for 8,000-hour overhaul.

READING AVIATION SERVICE at Reading, Pennsylvania, has installed a new Lear Vortan lightweight omni system in its Piper equipment demonstrator. Virginia Coal and Iron's D-18 Beech, flown by Chuck Sowa and Frank O'Brien, has received dual ARC omni, dual ARC ADF, ARC CD-

Airmen's Calendar

May 4-5—Missouri Pilots Association Convention, Springfield.

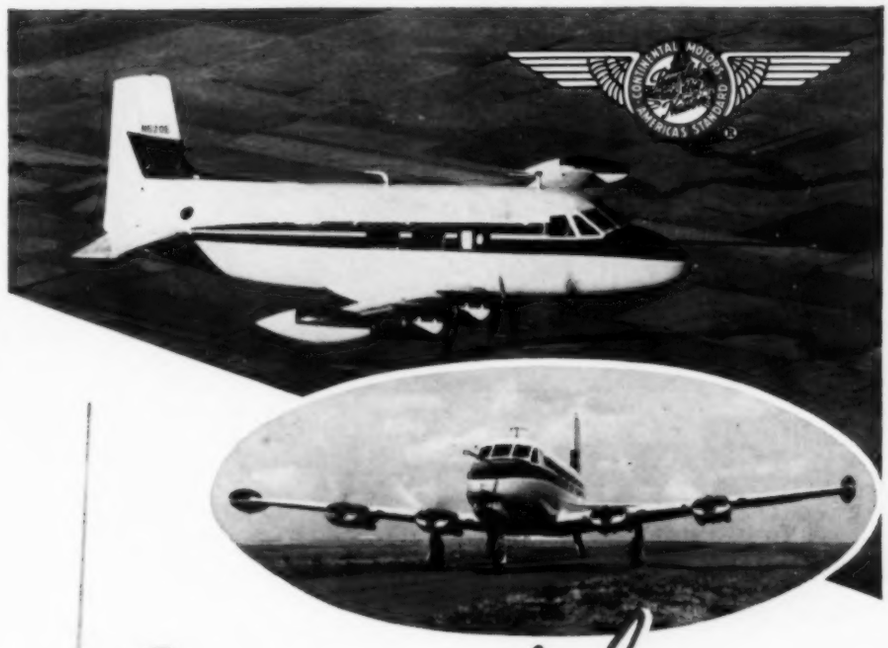
May 5-8—30th Annual Convention, American Association of Airport Executives, Shamrock Hilton Hotel, Houston. Contact Paul Koonce, General Chairman, Houston International Airport.

May 8-11—13th Annual American Helicopter Society National Forum, Sheraton-Park Hotel, Washington, D. C., Harry Lounsbury, Executive Secretary.

May 26-June 2—Aviation Writers Association Convention, St. Louis.

June 1—8th Annual Maintenance and Operations Meeting, Reading Aviation Service, Municipal Airport, Reading, Pa.

June 1-9—First Annual National Aviation Trades Show and Exhibits, Monmouth County Airport, New Jersey.



Continental Shares in Another "Aviation First"

. . . CESSNA MODEL 620, WORLD'S PIONEER PRESSURIZED FOUR-ENGINE EXECUTIVE TRANSPORT

Two organizations long noted for their contributions to flying have joined hands to achieve another major aviation "first," Cessna's Model 620, now flying. . . . The Cessna Model 620, world pioneer of its type—first pressurized four-engine airplane built for the corporate market—unites several qualities which users of executive aircraft have long desired. Its four Continental Red Seal GSO526-A engines provide four-engine safety, with the important plus of Continental dependability, economy and service backing. It is pressurized for altitudes up to its four-engine service ceiling of 27,500 feet, and air-conditioned for comfort aloft and on the ground. . . . Flights climaxing three years' work on this advanced airplane have fully borne out its builders' highest expectations. The Cessna 620 now takes its place as the latest on the long roster of fine utility aircraft using dependable Continental power.

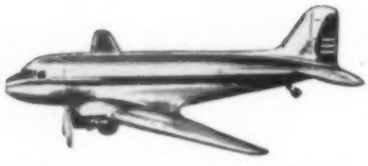
Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

NOW!

For executive and corporate aircraft ...the NEW

FACE MASK

Unlimited Visibility! Complete Smoke and Fume Protection!



Smart corporate and executive aircraft pilots are taking a tip from the commercial airlines by equipping with the Scottoramic. It gives pilots that vital side vision so necessary for safe, smooth landings. It also protects from smoke, fumes and CO_2. You're prepared for any breathing hazard when you choose the face mask with Vision Unlimited.

Write today for further information.

Scott — SINCE 1937 — FOR SAFETY—OUR SERVICE

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Export: Southern Oxygen Co.
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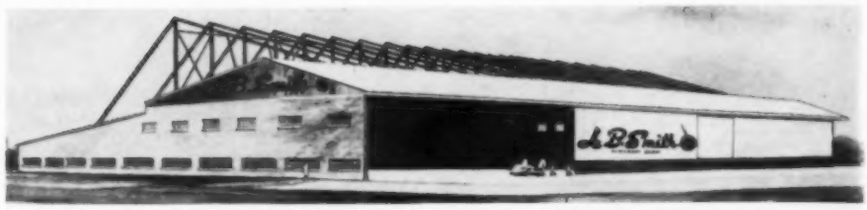


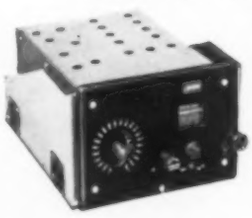
NEW MILLION-DOLLAR HANGAR FOR L. B. SMITH AIRCRAFT CORP. is under construction at Miami International Airport on 36th Street across airport from present location. It was designed by Erwin-Newman Co. of Houston, Texas.

ULTIMATE IN DC-3 COCKPIT ROOMINESS has been gained in Don Beeler's "Flying Ginny" (above) by Executive Aircraft Service, Dallas. Integral outer panel tanks for 1,150 gals. permitted conversion of center-section tank area to equipment bays for all radio, Janitrol heater and CB system. New hydraulic system is in desk at right. Desk at left has RCA radar scope, Sperry analyzer, autopilot heading selector. New crew chairs have removable headrests.

1 course director, ARC T-21 transmitter and a new carpet with Golden Foam underlay. Also in the RAS hangar for service have been W. & J. Sloan's new Super 680 Commander, Correale Construction's Super 680 and Sutter Lumber's 520 Commander. Theodore Smith of Philadelphia has received an RAS installation in his twin Cessna of twin Narco Mark 2 omnigators with low and high-band transmitter frequencies, covering 27 channels.

BEISER AVIATION CORP. has won an Army contract to handle supply and maintenance for some 30 fixed-wing aircraft and 30 helicopters used in electronics test work at Fort Huachuca, Arizona, which is operated by the Army Signal Corps as an electronics proving ground. The maintenance will require about 110 mechanics and some 40 supply and administrative personnel. Beiser operates the USAF Contract Primary Flight School at Marana Air Base,

DARE MICRO-TUNER SYSTEM



The Completely Flexible VHF System For Communications—Navigation—or Both

Modular construction includes 22-channel 3-4 watt transmitter, precise tunable receiver, dynamotor power supply, omni-ILS indicator and omni converter. Direct or remote control units. All equipment is shockmounted, resulting in better performance and easier servicing. Ideal for helicopters, business planes and private aircraft. Write for details.

Available from 55 leading aircraft distributors

DARE, INC.
TROY, OHIO

FIRST CORPORATE VISCOUNT TURBOPROP FOR U. S. BUSINESS FLYING is receiving custom interior and equipment installations at L. B. Smith Aircraft Corp. in Miami. Four Viscounts have been flown from the Vickers factory in England to Miami by Capitol Airlines crews for the installations.

Tucson, and recently won an IRAN competition for T-6 trainers earmarked for the Mutual Defense Assistance Program.

AIRCRAFT SERVICE ASSOCIATION, comprised of firms performing contract maintenance and overhaul of military aircraft, engines and accessories, has elected new officers as follows: Douglass F. Johnson, Aircraft Engineering & Maintenance, Oakland, chairman; Harold C. Stuart, Tulsa, president; Winston Castleberry, Southwest Airmotive, vice president; and Robert M. Scott, Washington, D. C., secretary-treasurer.

AIRWORK CORPORATION's Atlanta and Miami branches have been named Southern distributors for Bendix Utica products with the Atlanta branch maintaining both a parts warehouse and an accessory overhaul shop. The two branches also are Bendix-Redbank and Montrose distributors.

Left to right are F. H. Isaacks, Manager of Cameron's Southern Louisiana Division; Roy Davis, Domestic Sales Manager, and Herbert Allen, Vice President and General Manager of Cameron Iron Works, Inc.

Seaplane Speeds Service, Cuts Costs for Cameron

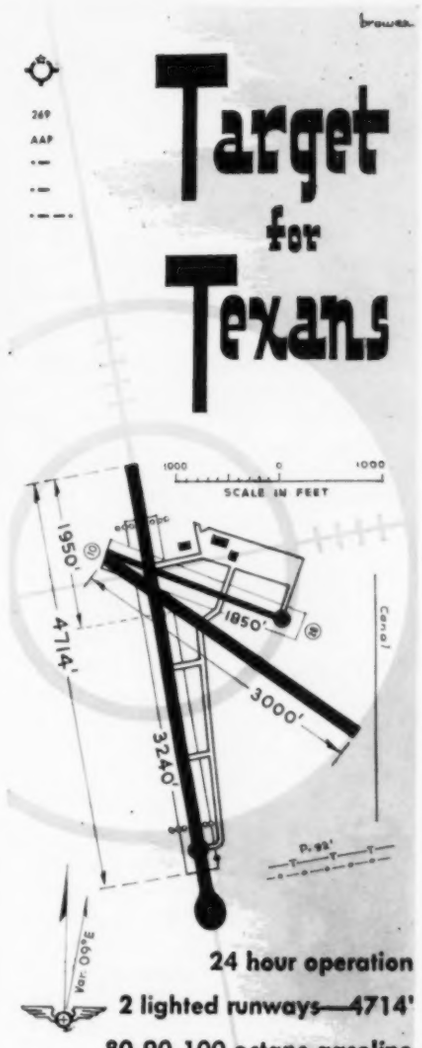
CAMERON IRON WORKS, INC., Houston, Texas, manufacturers of high-pressure, off-shore drilling controls and well-head equipment, use their Cessna 180 on Edo Amphibious Floats for sales and off-shore service.

"This plane enables us to serve off-shore installations in the shortest time possible," says Herbert Allen, General Manager. "We are now able to make 10 calls in the same time previously required to make one.

"In addition to saving us valuable time, our Amphibian has enabled us to reduce service expense. The cost on the crew boats previously used was $65 for an 8-hour day. The plane operates at a cost of $22.46 an hour, but in that hour we are able to do what used to be a full day's work."

EDO, WORLD'S FOREMOST MANUFACTURER OF AIRCRAFT FLOATS, makes a complete line of standard and amphibious floats for many types of airplanes. Could a versatile, rugged seaplane assist in your business? See your nearest EDO Float dealer or write for details to:

Edo SINCE 1925
CORPORATION
College Point, Long Island, New York



24 hour operation
2 lighted runways—4714'
80-90-100 octane gasoline
Low Freq. Homing Beacon
269 kc AAP
Expanded Cafeteria facilities
15 miles Due West of Houston
Transportation to Houston and Shamrock Hotel

AVIS RENT CARS ON FIELD

Andrau AIR PARK

Houston

AIR MAIL • 1918

Out of the war came not only pilots, skilled in the handling of aircraft, but an idea that the airplane might be put to practical commercial use. A natural outcome of this idea was institution of the air mail service.

This assignment was given to the army by the Post Office Department and on May 15, 1918, the first mail was carried by plane from Washington, D.C. to an exchange point in Philadelphia, and then on to New York City. This was probably the first commercial use of the airplane.

Real recognition of aviation's future came in 1928 when, with vision and foresight, a few leading insurance companies pioneered in combining their resources in forming a pool known as The United States Aircraft Insurance Group, to underwrite the industry with "aviation insurance", a much needed financial assist at the time.

Now grown to 64 companies with multi-billion dollar assets, this same "U. S. Group" continues to serve the aviation market with dependable insurance, as it has continuously for the last quarter century.

Whatever your needs for aviation insurance, be sure that you have the lasting security and many other distinctive benefits of a "U. S. Group" policy. Coverage can be conveniently arranged through your own agent or broker.

THE TRADE MARK USAIG OF DEPENDABLE SERVICE

UNITED STATES AVIATION UNDERWRITERS, Incorporated

80 JOHN STREET, NEW YORK 38, N.Y.

WIDE-WING AERO COMMANDER

(Continued from page 21)

"Greater inherent stability is quite pronounced, and one who is familiar with the well-known stability characteristics of the Commander series will be quick to notice the improvement of the E model."

Smith said structural configuration of the E is identical to previous Aero Commanders except for the wing-tip extension, which is carried out in conformity with the surrounding structure. In CAA flight tests for the Model E, which was certificated on February 21, the new version was flown to an indicated speed 11 mph. above the required 300 mph. in a dive. Its never-exceed indicated speed is 270 mph., gear extension indicated speed is 160 mph. and flap extension indicated speed is 130 mph.

With its many refinements, the wide-wing 560E is expected to establish itself as the finest Aero Commander yet produced.

Aero Commander production was at a level of 20 airplanes a month — 1 a day — when we visited the plant last month and Serial Number 538 had fuselage and wing mated before March 1. As of last month, all models on the line will have the main gear positioned 4.25 ins. rearward for heavier nose load balancing in ground handling.

ROTC FLIGHT TRAINING

(Continued from page 25)

to $10,000 and $12,000 airplanes for training and have to depend on high-priced prima donna instructors, they could easily price themselves right out of the market. Another problem in some schools is how to keep instructors employed during the three summer months. They will have to be paid on an annual basis to retain them. These schools hope that some ROTC students will be available for flight training during the summer sessions.

Every school is impressed with the high calibre of students they are getting for the program. They are all senior students and have been carefully screened and educated for three years in order to meet the high requirements necessary for commissioning upon graduation. Consequently, the instructors are impressed by the quality of students, the speed at which they learn and the interest they take in the program.

The whole matter revolves around the ability of the institutions to give the highest quality training at a reasonable cost. And there can be no question of its continuance.—G.E.H.

SAFETY where it COUNTS

At Faulkner Air Radio safety is the WATCHWORD! Safety in the sale — your assurance that you buy only what you need and and want. Safety in engineering — only the most highly skilled technicians touch your equipment. Safety designed custom installations — designed to fit your specific needs. Safety in maintenance — the entire technical staff at Faulkner Air Radio stands ready to maintain your equipment and keep you flying.

Faulkner Air Radio
HOUSTON, TEX.
INTERNATIONAL AIRPORT

- BENDIX
- ARC
- NARCO
- LEAR
- COMCO
- SUN AIR
- DARE

FROM BUSH TO BIG-TIME

(Continued from page 23)

ing up competitive air services in the territory, the first of many acquisitions being Kamloops Air Services and Skeena Air Transport. The Baker enterprise became big business in 1951, its fifth year, when it negotiated its first million-dollar deal — the great Alcan airlift of construction supplies for Kemano-Kitimat projects. His operations in 1952 were established at seven charter bases and at 12 points to which he provided Class 2 air service. His air fleet totaled 18 aircraft, which flew over 1,500,000 passenger-miles that year. What had been a river-bank bush operation became in 1953 a thriving business when Baker acquired a new name, "Pacific Western Airlines," and Department of Transport authority for operation of Group A (super airliner) type equipment, along with the purchase of another competitor, Associated Air Taxi, Ltd., and its subsidiaries, plus a franchise to operate a Class 2 service on a per-unit toll basis between Vancouver, Kemano and Kitimat. Baker took in $1,500,000 during the year and was on his way.

With big money coming in, Baker's expansion became widespread in 1954-55 as he acquired more operations — Whitehorse Flying Services in the Yukon territory, making Baker the largest contract charter flying service in Canada; Queen Charlotte Airlines, a million-dollar deal itself, and Edmonton-headquartered Associated Airways, built up from scratch in 1945 by T. P. Fox, now rated as one of the Canadian aircraft industry's top-ranked executives.

In these later acquisitions, Pacific Western was able for the first time to experiment with some of Baker's unique operational concepts. One was the pioneering of low-cost "air-bus" schedules shorn of costly frills such as reservations and baggage handling. Tried on the Queen Charlotte run between Vancouver and Powell River, fares were dropped about 25 per cent to near bus-fare levels for air service which, for example, whisked a passenger from Vancouver to Powell River in 25 minutes as compared to 6 hours for the bus trip. Traffic which had stalled at 30 to 40 passengers daily jumped to 130 a day.

In the Yukon, Baker's Beavers conducted a unique airlift by moving some 300 tons of heavy freight from the Portland Canal, which separates Alaska from Canada, to the site of the Granduc Copper Mine, located on a glacier at 3,500-ft. elevation, despite rugged conditions including the worst flying weather on record.

But Baker's Pacific Western Airlines entered the big-time in air freight in 1955 when it took over as prime contractor on the central Canada section of the $300,000,000 DEW Line Airlift dumped into the laps of Canadian operators by provident Uncle Sam — the world's most gargantuan

FLIGHT MAGAZINE's youngest subscriber is Barbara Anne Lerom, six-month-old daughter of Mr. and Mrs. John I. Lerom of Cincinnati. She is pictured sitting on the old man's World War II jump sack used while he was a pilot with USAF. Formerly an under-secretary of the Air Force, Lerom is now with General Electric Company. Barbara's mother is the former Barbara Small, chief Western Air Lines stewardess.

It's almost like
LANDING ON YOUR HOTEL
WHEN YOU LAND AT
DOWNTOWN AIRPARK
5 MINUTES FROM DOWNTOWN IN
OKLAHOMA CITY
• Big enough for anything (from a "puddle-jumper" to a DC-3)
• Two paved runways (3,400 feet N-S; 2,400 feet NE-SW)
• Night lighting
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• Complete maintenance and repair shops
• Lycoming distributors
• Restaurant service
• Call Unicom 122.8
AERO Commander — Distributor For Oklahoma

SERVICE GUIDE FOR FLIERS —

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THE PERFECT OVERNIGHT AND LUNCHEON STOP

STEWART AIR PARK
HOWARD JOHNSON'S RESTAURANT
SKY MOTEL ACCOMMODATIONS
COMPLETE SERVICE FACILITIES
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